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COMPUTERWORLD

Vendor security chiefs cite LAN, laptop threat

BY MICHAEL ALEXANDER
CW STAFF

SAN DIEGO — Information systems security professionals at the nation's top computer firms are spending sleepless nights worrying about computer security, ironically as a result of the widespread use of personal computers, laptops and networks.

At the Information Systems Security Association's eighth annual conference here last week, security chiefs at Apple Computer, Inc., Digital Equipment Corp., Hewlett-Packard Co. and IBM talked about the challenges of protecting PCs and the networks that link them to each other and to host computers.

IBM has some 225,000 PCs and workstations in-house, primarily connected to host computer systems. "My biggest fear is someone will pick up [a PC or workstation] and walk off with it," said Phil Dolan, information security program director at IBM. The value of the information contained on a hard disk is apt to be considerably higher than the actual cost of the PC; thus, proprietary information should not be kept on any PC.

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Assault tactics

• The use of computer viruses as weapons is under review by the U.S. military following the war in the Persian Gulf. Software-intensive battlefield systems are at the highest risk, according to experts.
See story page 97.

Pan Am to go outsourcing route

BY RICHARD PASTORE
CW STAFF

NEW YORK — To help shed some operating costs and pick up badly needed cash, Pan American World Airways, Inc. is negotiating what could be one of the largest outsourcing contracts ever. Within the next three months, the airline is hoping to award a contract worth $500 million over five years to one of several outsourcing vendors.

Vice President of Information Services Robert O. Wagner told *Computerworld* that the company is planning to sell its proprietary applications, software licenses and hardware and turn over its 500-plus-person information systems staff to one of several vendors. The possibilities include Electronic Data Systems Corp., IBM, Andersen Consulting, AT&T and SITI, a France-based airline association.

EDS confirmed that it has been approached by Pan Am, but no deal has been consummated. "It is our intent to be a major force in providing service to the airlines," said Nate Lanford, transportation division vice president. EDS is currently competing with IBM for the System One Corp. reservations system

Continued on page 96

Top outsourcing pacts

Firm	Value	Contract under
Enron Corp.	$750M	EDS
First City Bank Corp.	$600M	EDS
Eastman Kodak Co.	$500M	IBM
National Car Rental System, Inc.	$500M	EDS
Pan American World Airways, Inc.	$500M	?
First Fidelity Bancorp	$450M	EDS

Source: Merrill Lynch Capital Markets — CW Chart: Marie Rahm

Firestone, Oracle trade contract suits

Tire maker charges missed deliveries scuttled national on-line system

BY ELLIS BOOKER
CW STAFF

AKRON, Ohio — Had all gone as planned, Bridgestone/Firestone, Inc.'s 1,600 service facilities would today have on-line access to a flexible customer and parts database and be the envy of the automotive repair industry.

However, the ambitious Mastercare Systems Project is up on blocks, with Firestone seeking $40 million in damages from its software vendor, and the vendor, Oracle Corp., suing to collect the remainder of its bill.

According to court documents obtained by *Computerworld* last week, the Firestone suit, filed Feb. 27 in U.S. District Court for the Northern District of California in San Jose, seeks at least $10 million in damages from Oracle for alleged breach of contract and other claims.

The nine-count breach of contract suit states that Oracle failed to deliver its SQL*Forms Version 3.0 and RDBMS Version 6.0 database products on time or with the required features. At the time of the Mastercare contract, neither product was commercially available.

Firestone also charged fraud and negligent misrepresentation, arguing that Oracle knew its products would not fit the Mastercare project's timetable or requirements.

Continued on page 95

IBM plans OS/2 revival

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Its back against the wall, a determined IBM refuses to throw in the towel on OS/2. Next week, the computer giant is expected to reveal its latest and biggest effort to win over the so far mostly indifferent masses.

IBM is expected to offer a series of bundling and packaging options, including the option to purchase components of OS/2 Extended Edition separately.

In addition, IBM executives will reportedly provide insight into and assurance about how OS/2 will tie into future Personal System/2, multimedia and networking directions.

The basic song will remain the same: OS/2 is central to IBM's long-term plans. "It's important that we get out the message — what we're doing and where we're going — to clear up the confusion," an IBM source said.

Continued on page 8

DEC hatches alternative to Systemview

BY ELISABETH HORWITT
CW STAFF

MAYNARD, Mass. — Seven months after IBM made its Systemview announcement, Digital Equipment Corp. has entered the integrated systems management fray with its own offering, Polycenter.

The two vendors are locking horns over what both have identified as one of the decade's hottest markets: corporate users who want to centralize and automate systems management operations across distributed, multivendor hosts, with lights-out operations as the ultimate goal at remote sites.

Both vendors have promised to manage other vendors' systems via published application programming interfaces and support of common industry standards such as Open Systems Interconnect and the Open Software Foundation's Distributed Management Environment.

By 1995 or 1996, Polycenter is expected to provide fully integrated, multivendor, lights-out systems management, DEC group manager Patrick Mullen said.

Continued on page 6

Common ground

Both IBM's Systemview and DEC's Polycenter are anchored by similar features:

- Object-oriented data repository
- Graphics-based user interface
- Standards-based network interfaces
- Published application programming interfaces
- Integration with network management platform
- Centralized management, control and monitoring

INSIDE

IBM fills in ES/9000 line at the top, updates AD/Cycle strategy. Page 6.

Wang reaches for future with work-group strategy but provides little detail. Page 95.

Latest consortium plots tool set for multinational, multivendor document transfer. Page 8.

Product Spotlight — Streamline or completely revamp sales procedures with sales force automation software. Page 59.

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8 Make way — it's the international **Open Document Architecture Consortium**, named after IBM and DEC's standard to allow multinational vendors to exchange documents over multivendor networks.

10 A computer guru and witness in the **Justice Department/Inslaw** controversy is arrested by the DEA on drug charges.

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95 You can choose your friends, and you can choose your computers, but you may not be able to choose your friend's computer if it's a **Wang** — now that the VS operating system license is nontransferable.

Quotable

"We looked for someone who could run more plankton through the whale."

PAUL G. ADAMS
FIRST AMERICAN DATA SERVICES

On why the company chose to outsource with Perot Systems. See story page 95.

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The 5th Wave

"HELLO, SMART-HOME MAINTENANCE? CAN YOU SEND SOMEONE OUT - OUR DEN IS ACTING REALLY STUPID."

Rich Tennant

EXECUTIVE BRIEFING

■ **Pan Am is set to award** one of the largest outsourcing deals ever, with a total value that may exceed $500 million. The airline has not yet decided who will get the contract but says it hopes to sell its own applications to smaller airlines through the outsourcing vendor. **Page 1.**

■ **Fax technology is increasingly coming under information systems control** as more companies rely on it for mass distribution of information. No one expects IS groups to start managing individual fax machines in user departments, but experts say IS must take notice of the expanding role of faxes in corporate networks. Those who have done so say the economies of scale are tremendous. **Page 53.**

■ **DEC will go up against IBM's Systemview** in the market for integrated systems management. DEC's Polycenter entry manages computing and communications resources across an enterprise but is said to better accommodate other vendors' equipment. **Page 1.**

■ **GTE and Contel expect savings to reach $40 million** as a result of data center consolidation following their $6.6 billion merger. The two-year effort involves combining IBM and Honeywell hardware and telecom applications as well as closing Contel's four data centers by 1993. **Page 71.**

■ **Computer security worries plague even the giants** of personal computing. Security chiefs from Apple, DEC, HP and IBM say portable computers and proliferating local-area networks are making their headaches even worse. **Page 1.**

■ **Military officials are concerned** about the potential damage computer viruses could cause to computerized weaponry following the outbreak of several viruses during operations in the Persian Gulf. But they're also intrigued by the possibility of using viruses as a tactical weapon. **Page 97.**

■ **Don't look for an end to the Unix wars,** even though AT&T has sold off 22% of its Unix operation. Open Software Foundation adherents say AT&T's moves are too little, too late. **Page 12.**

■ **IBM introduces a five-way processor model** in its Enterprise System/9000 line and takes steps to encourage mainframe customers to move upward. **Page 6.**

■ **Wang will look to entice office work groups** with services, groupware technologies and multimedia. Customers are intrigued but want to see products to back up Wang's claims. **Page 95.**

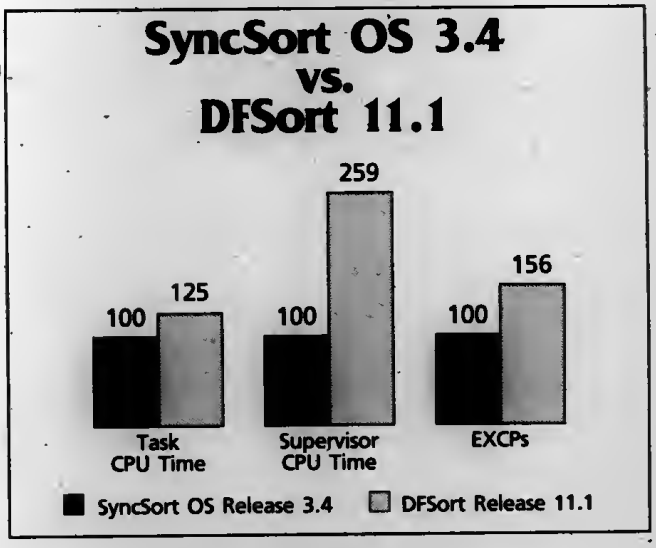
■ **"Impressive"** is what observers are saying about AT&T's forthcoming notebook PC, which is expected to be introduced this month. The Safari PC reportedly features an optional cellular fax/data modem, Windows Version 3.0 in read-only memory and up to 100M bytes of disk storage. **Page 95.**

■ **More than half of new Application System/400 installations** are replacing existing System/36s and System/38s, according to a survey by Computer Intelligence. **Page 27.**

■ **A very different Control Data** is trying to reassert itself in the computer industry. The new CDC has divested a lot of its businesses and is refocusing on open systems, manufacturing and engineering. **Page 77.**

■ **On-site this week:** A West Coast health maintenance organization turns to a DEC VAX 9000 and clustering to keep its database performance in the pink. **Page 29.** Rapid response is the driving force behind a Michigan bank's multifaceted PC program. **Page 35.** A California design house credits computer-aided design workstations and a commitment to creativity with its success in designing functional, easy-to-make products. **Page 37.** It took the clout of Los Alamos National Laboratory to get an 800M bit/sec. channel considered as an ANSI standard. But it worked. **Page 45.**

THE BEST KEEPS GETTING BETTER.



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Banyan opening up with Vines

Firm reacts to market, user demands to support OS/2, additional APIs

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — Stepping carefully amid the musical chairs atmosphere of the thriving local-area network market, Banyan Systems, Inc. confirmed last week that it will formally introduce today a more "open" version of its Virtual Networking System (Vines) network operating system, which has been in beta testing since November.

Market pressure and user demand have prompted Banyan to support OS/2 and further integrate Microsoft Corp.'s MS-DOS/Windows 3.0 as clients [CW, March 25] onto Vines Version 4.10, rolling out this week at the Association of Banyan Users conference in Montreal.

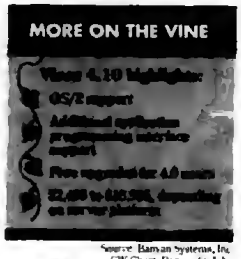
In addition, Version 4.10 supports several key application programming interfaces (API), software that allows applications programs to talk to communications software.

"The level of Windows integration in 4.10 is much improved over 4.0. Now we don't have to exit the Windows environment to mount file and print services; we can do it all with the Windows file manager and printer tool," said Jonathan Oski, a senior technical engineer at Boston's Bank of Tokyo Financial Corp. and a Version 4.10 beta tester.

However, Tom Thomison, technical director in the gas department at Houston-based Texaco Exploration and Producing, Inc., said Banyan still has steps to take with its level of Windows integration.

"For example, there are Windows network utilities Banyan needs to write," Thomison said. "Within Vines, you have utilities for maintaining users and managing the network. Banyan needs to make those functions available as Windows applications instead of only as DOS applications that appear in a DOS text window."

A stumbling block for Vines has been that the 55% market share garnered by competitor Novell, Inc. has made it more lucrative for third-party software developers to create products for Novell's Netware network operating system than for Vines.



Source: Banyan Systems, Inc.
CW Chart: Doreen St. John

The added API support aims to ease the Vines application development task and open up relationships between Banyan and third-party developers, according to a Banyan official.

Vines 4.10 supports electronic mail and network management APIs that allow third-party developers to write front ends to applications for Vines to suit users' environments of choice.

Support of APIs

The network now also supports Named Pipes and Mail Slots. This means programs can be concurrently developed for LAN Manager and Vines, which should attract some developers to Vines by default, according to Mark Leary, director of communications research at Technology Investment Strategies Corp.

"Banyan will never convince developers to create applications just for Vines," he said.

Oski said his Named Pipes API beta test "has been solid from the very first. It is important to us because now we're able to run OS/2 SQL Server, a key application for us."

Consortium backs plans for standard RISC box

BY JOANIE M. WEXLER
CW STAFF

Networking company Banyan Systems, Inc. is slated to make a guest appearance at tomorrow's unveiling of a blueprint for a potential "industry-standard" reduced instruction set computing (RISC)-based workstation by about 20 computer products vendors.

One industry analyst said he presumes Banyan's participation in the Advanced RISC Computing Architecture Consortium indicates that Banyan intends to port its Virtual Networking System (Vines) network to the resulting RISC architecture.

The firms invited to the briefing indicate that the leading consortium members are Compaq Computer Corp., Digital Equipment Corp., Microsoft Corp., Mips Computer Systems, Inc. and The Santa Cruz Operation.

A Banyan spokesman last week said only that "this is a Compaq-initiated effort; if the resulting workstation becomes a standard, it is in Banyan's best interest to support it." Compaq is Banyan's largest customer, and Compaq Deskpro 386 and Systempro computers are certified as Vines servers.

Unofficially official

The spokesman would not confirm whether Banyan is an official member of the consortium. However, Banyan's director of business development, Bill Johnson, said that the enterprise-wide-oriented networking company backs the concept of a standard RISC architecture for clients as well as servers.

If the RISC architecture does become standard, support could boost Banyan's and Microsoft's status in the local-area networking business vis-a-vis market leader Novell, Inc. There has been no indication of Novell's involvement in the consortium.

A "standard" compute-intensive chip in a Compaq computer would allow that computer to run either Microsoft's emerging, portable OS/2 Version 3.0 operating system or Unix.

The vendors participating in the consortium are said to be planning a single binary application interface for a Mips processor to ease applications development for the new-generation platform.

Compaq buys into Silicon Graphics

BY J. A. SAVAGE
CW STAFF

HOUSTON — Compaq Computer Corp. bought into the reduced instruction set computing (RISC) workstation market last week, but the first fruits of the deal may turn up in the form of more powerful Intel Corp.-based personal computers.

Compaq paid $145 million of a 13% equity stake in Silicon Graphics, Inc., a Mountain View, Calif.-based maker of high-performance workstations based on the Mips Computer Systems, Inc. RISC chip. Compaq also said it will invest another $50 million in joint research and development with Silicon Graphics.

Silicon Graphics also licensed its basic graphics software to Microsoft Corp. last week. Although Microsoft has yet to say where the software will fit into its product lines, its licensing of Silicon Graphics' Graphics Library is likely to set a graphics communication standard for PCs, according to analysts.

Predictions of power

Some observers said they expect Compaq will use the Silicon Graphics technology to boost the graphics power of its existing PC line. Tom Kucharvy, an analyst at Summit Strategies, said Compaq will probably offer its high-end Systempro with the Silicon Graphics three-dimensional add-in board.

A cooperatively produced Intel-based product is "very possible," said Lorie Strong, vice president of product marketing at Compaq. She said the deal allows the two firms to develop identical systems bundled differently for different markets.

Strong downplayed the idea that Compaq is buying into Silicon Graphics to get into the workstation market. "We're looking at graphics technology for broader business appeal. For instance, with Windows and multimedia, graphics will be a bigger part of the general business market," he said.

Some are skeptical of the PC's viability. Michael Goulde, an analyst at Open Systems Advisors, Inc., said an Intel platform is not likely to get far in the market. "The graphics won't perform well. You need the processing power of a RISC chip to do what Silicon Graphics does well."

Compaq is expected to announce this week that it will expand from Intel-based PCs and servers into the Mips Computer RISC architecture.

The graphics library being licensed by Microsoft allows real-time interaction between images and human manipulation, according to Karen Hargrove, business development group manager at Microsoft. Programmers Hierarchical Interactive Graphics Systems does not offer such interaction.

"We're investigating a variety of ways to use the graphics library," Hargrove said. "It could be on top of the operating system, in the operating system or in use with applications."

CORRECTION

The Trends chart on disk storage [CW, April 1] incorrectly identified the shipment forecast data as disk drive units. The chart should have read, "Magnetic rigid disk drives, capacity of worldwide shipments in terabytes."

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Oracle sets client/server OLTP performance records

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IBM boosts high-end ES/9000 lineup

BY ROSEMARY HAMILTON
CW STAFF

ARMONK, N.Y. — IBM last week expanded its large-system lineup with an additional high-end Enterprise System/9000, new upgrade paths to its premier mainframes and several systems software facilities.

Also last week, the company provided a progress report on its software development initiative, AD/Cycle, that included the addition of Easel Corp. as the latest member of the AD/Cycle inner circle.

The Easel addition resulted in another nod from IBM for MS-DOS and Microsoft Corp.'s Windows. Both Easel and IBM plan to market the Easel Workbench, an OS/2-based development tool kit that can produce code for other operating environments, including Windows, officials from both companies said.

The ES/9000 Model 860 is the third announced mainframe that uses the new-generation technology once known as Summit. The five-way processor, which carries a list price of $19.3 million, will be available in the second quarter of 1992. Four-way and six-way versions are on schedule for shipment later this year.

"It was a gap — and an important one," said Frank Gens, a vice president at Technology Investment Strategies Corp.

According to Gens, the five-way processor, along with additional high-end upgrade options, will provide users with more choices for taking the plunge from 3090 technology to the new generation. Previously, a user of the Model 720, which is based on the 3090 600J technology, could move up to a six-way Model 900 only. Users can now move from a Model 720 to a Model 820, a four-way, new-generation processor or a five-way Model 860.

IBM will also offer more upgrade options for its smallest mainframes, the 9370s. At the time of the System/390 announcement last year, IBM offered upgrade paths for 9370 users with high-end models. Last week, it extended the option to the entire 9370 line.

"What that tells me is IBM is trying to remove as many obstacles as they can for users to purchase ES/9000s," Gens said.

Last week, IBM also lowered the entry point to its fiber-optic channel architecture, Escon, to attract more users. Previously, a user was required to implement Escon with a minimum of 16 channels. The new minimum is eight channels.

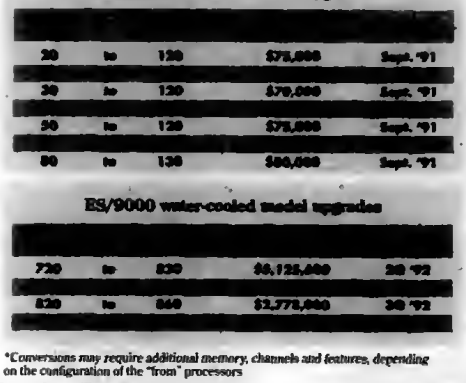
The software announced last week included security and system availability tools.

Mike Satejnberg, vice president of technical services at Manufacturers Hanover Trust Co., said he took note of the Processor Availability Facility, which would automatically move an executing program on a failing processor to another operational one.

"As we put more critical work loads in a single basket, all those features improve the overall stability of the environment," Satejnberg said. Manufacturers Hanover has been moving from several smaller mainframes to two high-end ES/9000s.

Onward and upward

IBM announced upgrades from ES/9370s to low-end ES/9000s as well as among high-end ES/9000s



*Conversions may require additional memory, channels and features, depending on the configuration of the "from" processors

Source: IBM

CW Chart: Tom Monahan

Bull to use IBM's Escon scheme

IBM and Bull HN Information Systems, Inc. have announced an agreement that will allow Bull HN to supply its mainframe customers with IBM's Escon technology.

"For Bull's large-system strategy to be both competitive and cost-effective, [the company] can't afford to develop everything in-house," said George Lindamood, program director of computer strategies at Gartner Group, Inc., a Stamford, Conn.-based market research and consulting firm.

Lindamood added that IBM is trying to position Escon as a full-fledged standards architecture, and endorsement from nonplug-compatible vendors is important.

The Escon technology replaces traditional I/O connections with fiber-optic channels and allows peripherals, such as direct-access storage devices (DASD), to be located at distances of up to 9 km from the CPU.

According to Ray Frye, senior project manager at Bull HN, the proprietary GCOS 8 operating system will be able to support the IBM fiber-optic environment.

"We are looking to achieve an IBM 9035 architectural equivalent, and to do that, the I/O subsystem in GCOS 8 must be redesigned," he said.

The IBM Escon Director will be supported for use with Bull HN DASD subsystems on the DPS 9000 mainframe. Bull HN plans to extend the Escon technology to other peripheral subsystems on GCOS 8 platforms. The target date for project completion is the second quarter of 1992, a Bull HN spokesman said.

SALLY CUSACK

All quiet on AT&T/NCR front; users tap feet

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — AT&T late last week said NCR Corp. Chairman Charles E. Exley Jr. set a nonnegotiable figure of $110 per share as the price for AT&T to buy out the computer company.

AT&T said Exley met with AT&T Chairman Robert Allen on Thursday following a meeting of the NCR board of directors. According to AT&T, Allen said AT&T will not pay $110 but is open to further negotiations.

AT&T also said Exley indicated he does not want NCR and AT&T to jointly discuss a pooling accounting issue with the Securities and Exchange Commission, an issue that would allow a tax-free merger.

NCR late Friday issued a statement saying AT&T's comments were one-sided and violated an agreement not to issue any statements about the meeting.

The week following the anticlimactic shareholders meeting at NCR's Dayton, Ohio, headquarters was a bit too quiet for users, who said they would like to see things move along.

"I kind of wish they'd get it over with," said Terry Svacina, manager of electronic data processing at The Popular Dry Goods Store Co. in El Paso, Texas. Svacina was one of several NCR users contacted last week who indicated they would like to see a resolution to the takeover battle.

Several analysts predicted nothing would happen until after the final vote counts were in from the NCR shareholders meetings March 28. The count is expected to be completed this week.

"I think the longer [NCR] waits, the better value they create for themselves," said Kevin Morrow, an analyst at The Ohio Co. in Columbus.

DEC

FROM PAGE 1

"That's the nirvana users are screaming for now."

Armed with Polycenter, "DEC will be much better equipped to walk in and say, 'Hey, even if you didn't buy hardware from us, we have the best management solution for your hardware as well as our own,' " said Terry Shannon, an analyst at International Data Corp. However, Polycenter shares Systemview's amorphous status as a blueprint that will be filled in over the next few years.

Like IBM, DEC is providing some initial substance to this framework by basing it on a "portfolio" of existing systems management applications and an existing network management system.

Unlike IBM's Netview, the DEC Management Control Center (Decmcc) Director does already include a formal data structure. DEC's Network Applications Support (NAS) architecture will provide the common protocols for integrating third-party applications and systems.

However, it will take a couple of years for DEC to start providing fully integrated systems management for VMS, Ultrix, OSF/1 and Unix System V environments via NAS and Decmcc Director. Polycenter will begin managing other vendors' operating environments about one year later, DEC said.

On target

DEC's initial concentration on providing integrated management for its systems seemed to fit well with many users' agendas.

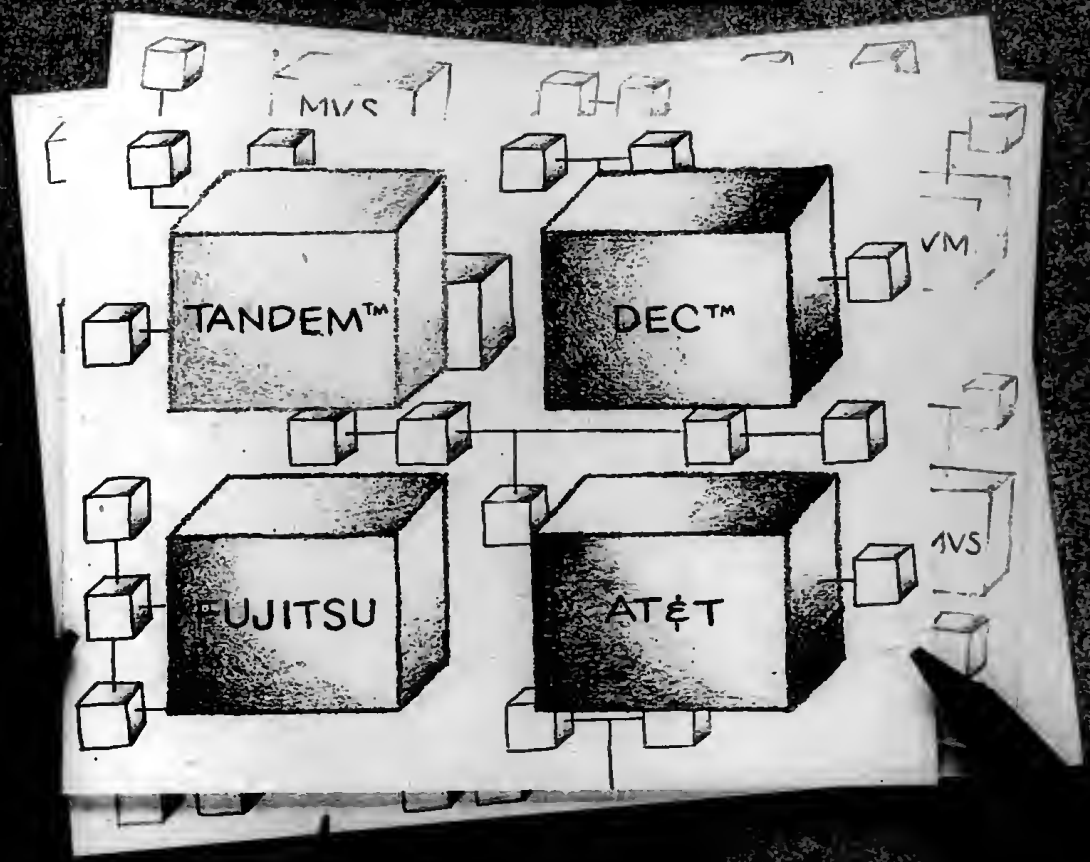
G. D. Searle & Co., for example, will probably start looking at integrated systems management in about one year, particularly for its overseas DEC sites, said Keith Addison, Searle's manager of network integration.

Right now, each remote site is responsible for disk management, minor applications development and ensuring that information gets shipped to a central site. With Polycenter in place, "users could enter transactions and data, and the rest we would take care of from across the pond," Addison said.

The Stevens Institute of Technology is eyeing Polycenter as a way to "improve productivity and offload a lot of tasks in an automated fashion" for managing Ultrix and VMS systems, said Leslie Maltz, director of computing and communications resources.

DEC began addressing users' demands for Ultrix/VMS systems integration last week with the following introductions:

- Remote System Manager Version 2.3 allows a centralized VAX/VMS system to back up centrally, install operating systems and distribute software to multiple remote VAX/VMS, VAX/Ultrix and — with the new version — reduced instruction set computing/Ultrix computers. Shipping is slated for May.
- A new version of DEC's Data Center Monitor for VMS and Ultrix, which introduces an expert systems component.
- Decinspect for VMS Version 2.1 implements and manages a security system across a distributed network of VAX/VMS computers.
- Decalert Software Version 1.1 consolidates alarm information from multiple VMS and Ultrix hosts.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NEWS SHORTS

Apple realigns R&D

In a move designed to accelerate the development of new products, Apple Computer, Inc. has segmented its research and development efforts along product lines. The new divisions — including Macintosh hardware, Macintosh software, object-based systems, enterprise systems, consumer products and advanced technologies — will serve to sharply focus resources to speed the creation of breakthrough technologies, according to Apple Chairman John Sculley.

Medusa ported to Ultrix

Computervision, a Prime Computer, Inc. company based in Bedford, Mass., announced that it has ported its Medusa family of computer-aided design and manufacturing software to Digital Equipment Corp.'s Ultrix operating environment. The port will allow Medusa to run on DEC's Decstation and reduced instruction set computing-based platforms, in addition to DEC VAX and Vaxstation computers. Shipments are scheduled to begin in July, and configurations for the Decstation will start at under $20,000.

Lotus enhances 1-2-3 drivers

Lotus Development Corp. said it is now shipping enhanced printer driver support with 1-2-3 Release 3.1. New drivers have been written to support printers from Canon U.S.A., Inc., NEC Corp., Panasonic Corp., Texas Instruments, Inc. and Adobe Systems, Inc. Color Postscript-compatible printers. In response to customer requests, several existing printer drivers were also bolstered. Lotus added support for the landscape printing capability on Hewlett-Packard Co.'s Deskjet, Deskjet Plus, Deskjet 500 and Paintjet XL printers and an update to HP's Laserjet Series II printer driver.

More secure VM/SP killed

IBM announced it will consolidate its efforts to develop secure versions of the VM operating system, primarily for the U.S. Department of Defense (DOD), by developing a trusted version of VM/ESA 1.1 and Resource Access Control Facility (RACF). VM/ESA and RACF will come with options enabling them to meet National Security Agency criteria for either C2 or B1 levels of trust, IBM said. IBM said it had abandoned a plan to develop a trusted version of VM/SP, based on user feedback suggesting DOD security requirements are centered on VM/ESA.

Kimtron founder dies

John Y. Kim, president and founder of Kimtron Corp., died recently at the age of 48. Kim founded his firm in 1979 and shipped its first product, a VDT, in 1984. Fremont, Calif.-based Kimtron became a division of Inkel Technology, Inc. last June. Kim leaves his wife and two children.

DG closes sale of Japanese division

Finalizing a $46 million deal, Data General Corp. sold its Japanese subsidiary, Nippon Data General Corp., to Omron Corp. in Kyoto, Japan, last week. The two companies announced March 12 that they had reached an agreement in principle. DG expects to report a gain from the sale of approximately $13 million in its third quarter, which ends June 29. Net cash proceeds for DG are estimated at $35 million. Omron is a $2.6 billion electronics firm, which deals primarily in office and factory automation and electronic fund transfer systems.

Filenet, Tandem sign deal

Document imaging vendor Filenet Corp. signed a joint marketing agreement with Tandem Computers, Inc. last week, which will put the Filenet systems on its fault-tolerant computer platforms. Filenet, based in Costa Mesa, Calif., said the agreement with Cupertino, Calif.-based Tandem was signed under Tandem's "Alliance" applications development program.

More news shorts on page 96

Consortium unveils document standard

BY MARYFRAN JOHNSON
CW STAFF

BRUSSELS — Make room for yet another consortium.

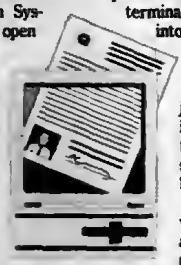
This latest industry alliance brings together six international computer vendors, including IBM and Digital Equipment Corp., which last week announced their support for a document interchange standard that will eventually enable multinational companies to exchange documents containing text, images and voice over multivendor networks.

Based here, the Open Document Architecture (ODA) Consortium also counts among its initial members Groupe Bull, Unisys Corp., Siemens Nixdorf Informationsysteme AG and ICL, Inc., a subsidiary of Fujitsu Ltd.

By 1993, the group intends to produce a software tool kit — to be openly licensed to software vendors and other computer firms — for building applications to meet ODA specifications.

European companies and governments have been the most avid supporters of ODA thus far, industry analysts said, but U.S.-based multinational companies are beginning to awaken to its importance. The lack of consensus on how data should be stored, accessed and shared has made document interchange a frustrating task for global companies such as Wilmington, Del.-based Du Pont Co. and The Boeing Co. in Seattle.

"We want to swap documents back and forth, and the only way to do it is to define international standards," said Warren Hoffman, a principal consultant at Du Pont Information Systems. "For Du Pont, open systems means products based on widely implemented, vendor-neutral standards. ODA is an example of that."



Developed by the International Standards Organization, ODA is a set of standards for structuring and encoding documents for easy exchange between multivendor computer systems. The goal is to have both sender and receiver see exactly the same image without wasting time retyping or reformatting.

Raymond E. Cairns Jr., senior vice president of information systems at Du Pont, said ODA will become a standard for the firm. "We will soon ask our key software vendors to incorporate the ODA Consortium's software in their products such as word processors, drawing programs, image systems and electronic-mail systems," Cairns said.

At Boeing Computer Services Co. in Bellevue, Wash., testing is already under way on ODA implementations from DEC, Xerox Corp. and Groupe Bull.

"We have a very great need to move our information with suppliers, vendors and partners immediately and electronically. The mail is too slow," said Joanna Vanderwilt, compound document interchange product manager at Boeing. "This consortium coming together is a good start."

Industry analysts also applauded the consortium's determination to breathe life into the complex but incomplete ODA standard, which is missing such major pieces as the ability to handle voice transmissions, spreadsheets or tables of data.

The consortium's work will be divided among the initial members, with DEC supplying the base technology to build the software tool kit and IBM managing the project and testing the products.

At IBM, adopting the ODA standard means jettisoning its internal standard for revisable, networked documents, called Mixed Object Document Content Architecture. While some analysts said the switch may cause further delays in Officevision, IBM said its customers should see little impact because ODA is just one of the standards involved in Officevision.

IBM revival

FROM PAGE 1

"This is a major announcement designed to convince corporate America that OS/2 is alive and well despite whatever Microsoft has said," said David Hanna, a software consultant and former IBM vice president now based in Menlo Park, Calif. IBM said OS/2 is fundamental to its large account strategy and control, he added.

IBM will present its strategy in briefings for its top 200 accounts, consultants, security analysts and the press. The sessions will include a case study on Plano, Texas-based Frito-Lay, Inc.'s OS/2 implementation and user, developer and hardware OEM testimonials.

David Liddle, president of Patriot Partners, will take turns at the podium with James Cannavino, IBM's vice president and general manager of Personal Systems; Earl Wheeler, senior vice president of the Programming Systems Division; and a host of top company executives.

There had been internal debate over whether to hold OS/2 2.0 until the object- and graphically oriented OS/2 2.1 is completed; that could be by the end of the year, a consultant close to IBM said. However, IBM has decided it must release Version 2.0 on schedule, according to two large OS/2 accounts. "That date is now firm," a user briefed by IBM claimed.

IBM said it has rolled out OS/2 2.0 to about 50 user accounts so far, with plans to test the product in at least 1,000 sites. With an anticipated third-quarter shipping date just three months away, a source close to IBM said to expect a "significant ramp up very soon" in beta-test distribution.

> "THIS IS A major announcement designed to convince corporate America that OS/2 is alive and well . . ."
>
> DAVID HANNA
> SOFTWARE CONSULTANT

IBM did decide to fold the enhancements slated for OS/2 1.4, which extends support for Extended Edition components to third-party hardware [CW, Jan. 14] into OS/2 2.0. The end result is the Extended Services Program. Scheduled for availability in the fourth quarter, it will eliminate a separate OS/2 Extended Edition by giving users their choice of the unbundled Database Manager and Communications Manager.

IBM will also discuss plans to put some as-yet-unspecified pieces of Officevision's Common User Access application programming interfaces into OS/2 and its Presentation Manager interface. IBM has already moved Officevision's drop-and-drag functionality into Presentation Manager.

Also on the agenda are various OS/2 bundling strategies, sources involved in the planning said. Among the options IBM is mulling over are shipping OS/2 with every Intel Corp. 80386-based PS/2, bundling OS/2 with other applications and cutting the price of OS/2. "These would not be unfeasible," an IBM source said. IBM will also roll out developer support programs, including joint marketing and development efforts.

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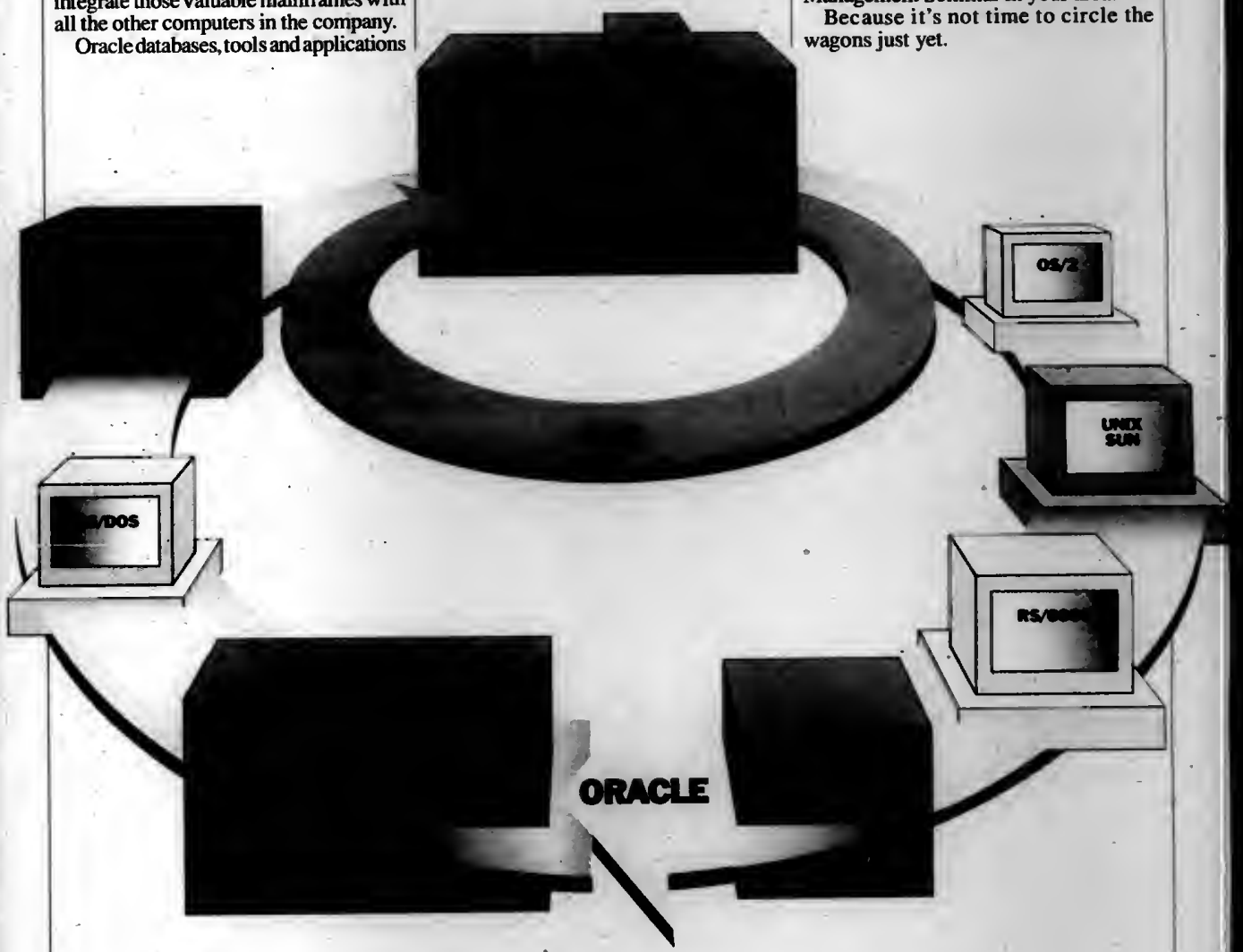

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Inslaw witness arrested

Computer expert nabbed for alleged drug distribution

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A shadowy figure in the long-running dispute between the U.S. Department of Justice and software developer Inslaw, Inc. has been arrested by agents of the U.S. Drug Enforcement Administration (DEA).

The arrest of computer expert Michael Riconosciuto near Tacoma, Wash., for alleged distribution of methamphetamines comes one week after Riconosciuto swore in a court filing that he had been threatened by a Justice Department official. The affidavit, filed on behalf of Inslaw, stated that Riconosciuto was warned in a telephone call from Justice Department official Peter Videnieks last February not to cooperate with a congressional probe into allegations that the Justice Department had stolen case-tracking software from Inslaw [CW, April 1].

Riconosciuto said Videnieks threatened that the Justice Department would prosecute Riconosciuto and his father for alleged wrongdoing in a California savings and loan case if he did not keep quiet about the Inslaw matter.

Riconosciuto said in his affidavit that he had received a copy of Inslaw's Promis software from Videnieks in 1983 and had modified it for use by intelligence agencies worldwide, specifically for the Canadian government, where, Riconosciuto said, it ended up.

Justice Department officials declined to comment on the allegations.

Two courts have upheld Inslaw's charges that the Justice Department misappropriated Promis, and an appeal by the agency is pending in the U.S. Court of Appeals in Washington, D.C. Meanwhile, the Judiciary Committee of the U.S. House of Representatives is locked in a struggle with the agency over 200 documents the committee said it needs for its investigation.

On the record

Riconosciuto is reported to have said he has several copies of a tape recording of the telephone threats, some of which were confiscated during his arrest.

The *St. Louis Post Dispatch* reported last week that Riconosciuto was arrested by more than one dozen DEA agents, one of whom allegedly advised him, "Keep your mouth shut."

"He said I was my own worst enemy and that I have a big mouth," the newspaper quoted Riconosciuto as having said in an interview from jail.

The DEA would not comment except to confirm the arrest.

Riconosciuto, who is a scientific tinkerer with reported ties to the U.S. intelligence community, was convicted of a drug charge in 1973.

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University puts Sonet in place

BY ELLIS BOOKER
CW STAFF

URBANA-CHAMPAIGN, Ill. — The University of Illinois has become the first end user to connect to a nationwide, high-speed research network using the Synchronous Optical Network (Sonet) standard.

The test began in mid-February and will run until May 1, according to Illinois Bell and AT&T.

Sonet is an international transmission standard for fiber-optic public networks. The international standards for Sonet range from 51.84M bit/sec. to 2.4G bit/sec.; the current North American standards go up to 45M bit/sec.

This is also believed to be the first time Sonet has been tried for customer applications using both a local- and a long-distance carrier, an AT&T spokesman said.

University testing

The test is being conducted at the university's Digital Computing Lab and involves a fiber link between the lab and an AT&T 5ESS digital central office switch. The switch is connected in turn to an AT&T central office and the Experimental University Network (Xunet).

Xunet is a high-speed research network connecting AT&T, participating local exchange companies and selected universities. It is being upgraded from a 1.5M bit/sec. to a 45M bit/sec. network.

Ameritech has not disclosed a Sonet delivery schedule for any of its local Bell operating companies. But at least one customer, Case Western Reserve University, wants to be ready when its local carrier upgrades its network to Sonet.

"The only way to make sense of campus networks long-term is that they flow naturally into the regional telecommunications grid," said Raymond K. Neff, the university's vice president of information services.

The University of Illinois trial uses DDM-2000 Sonet multiplexers from AT&T at the university lab, the Illinois Bell central office and the AT&T toll office. The applications in the university's computing lab are on a 45M bit/sec. link.

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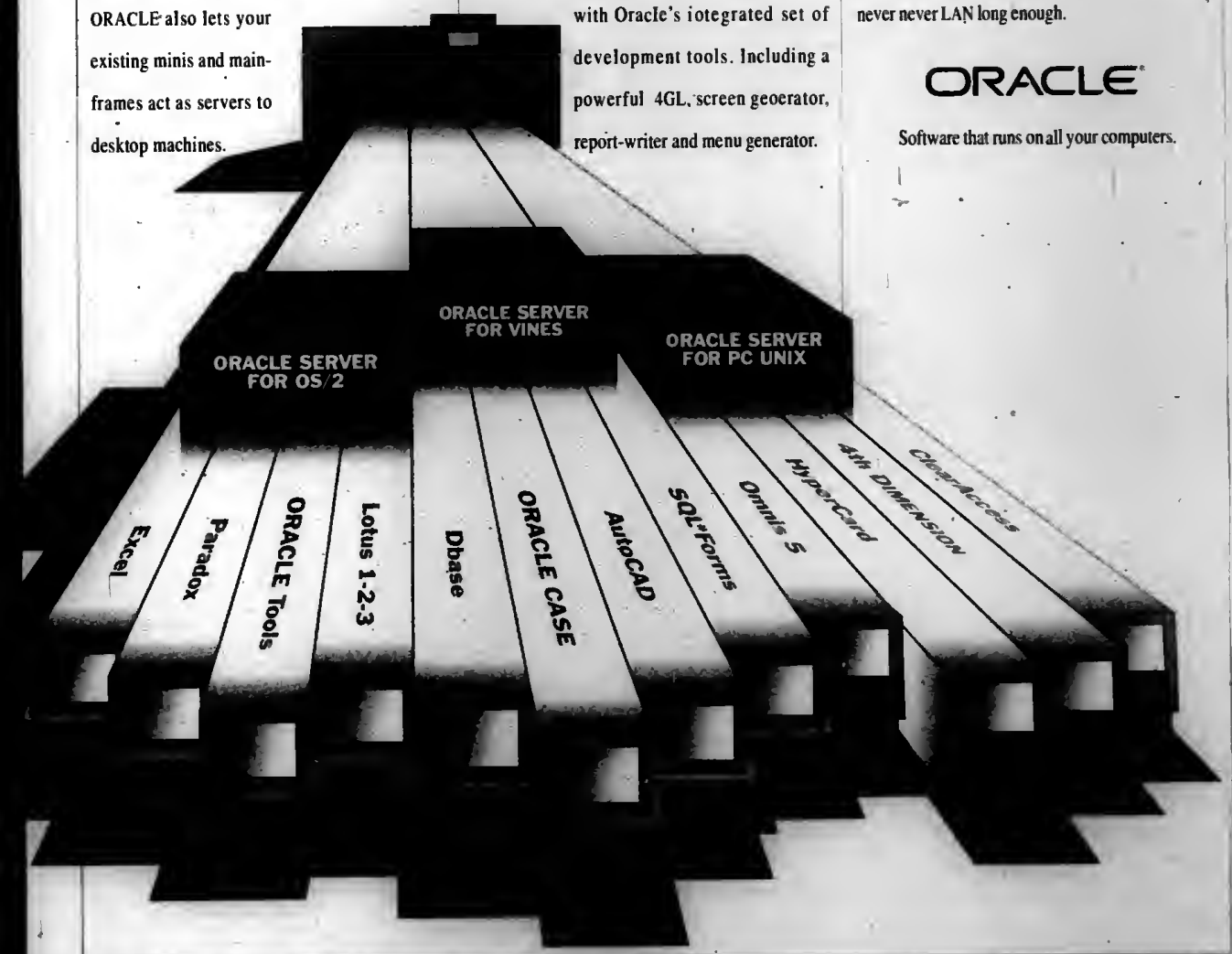

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AT&T's Unix sell-off won't sway OSF

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — AT&T announced last week the sale of approximately 22% of its Unix System Laboratories (USL) unit to outside investors. But observers said they do not believe the move will lead to closer organizational ties between USL and its chief rival, the Open Software Foundation (OSF), anytime soon.

As expected, the private-placement deal gave 11 computer vendors an equity position in USL and reduced AT&T's control over the unit that develops and licenses Unix System V and related products (CW, April 1). The long-term goal is to bring USL public within three years, executives said.

"This represents the creation of a new company which can independently focus on its customers and its business," said Robert M. Kavner, group executive at AT&T. Despite the fact that AT&T retains at least 60% ownership of USL, he added, "AT&T has no interest in controlling this company. Our best interest is in not controlling this company."

As a new entity, executives said, USL has 2,400 customers and 500 employees, with 1992 calendar year revenue estimated to be at about $100 million. USL's business plan calls for annual revenue growth of between 20% and 30%. Kavner also said USL has been profitable since 1989, but he would not provide details.

Furthermore, USL retains legal rights to Unix System V and related products, such as C++ and the Tuxedo transaction processing monitor, and maintains a relationship with AT&T's Bell Laboratories unit to be able to commercialize Bell Laboratories' Unix-related research.

The players involved

The USL investors include U.S.-based Amdahl Corp., Motorola, Inc., Novell, Inc. and Sun Microsystems, Inc. and European companies ICL PLC and Ing. C. Olivetti & Co. Other investors included Japan-based vendors Fujitsu Ltd., NEC Corp., OKI Electric Industry Co. and Toshiba Corp. Rounding out the group was the Institute for Information Industry, a Taiwan-based nonprofit organization that promotes the computer industry in that country.

The total value of the investors' equity stakes was said to be about $65 million, according to published reports.

Kavner would not comment on the deal's worth nor would he specify the stake held by each investor. But he did say that the individual equity positions range from 1% to 4.6%. About 10% of the equity is held for USL employees.

The breakdown of equity held by the European and U.S. companies is about even with that held by the Pacific Rim vendors, Kavner said.

Still, for some, this move comes too late. "This doesn't change anything for us," said Joe Menard, director of Ultrix marketing at Digital Equipment Corp. in Nashua, N.H.

"AT&T is three years late," Menard said, referring to when the OSF was established because of the perception that AT&T was controlling Unix development to the detriment of other industry vendors.

Reaction was not much more positive from the OSF. David Tory, president of OSF, said through a spokeswoman: "AT&T's selling off a minority interest to the 11 companies doesn't impact OSF whatsoever. It doesn't change the control of the company."

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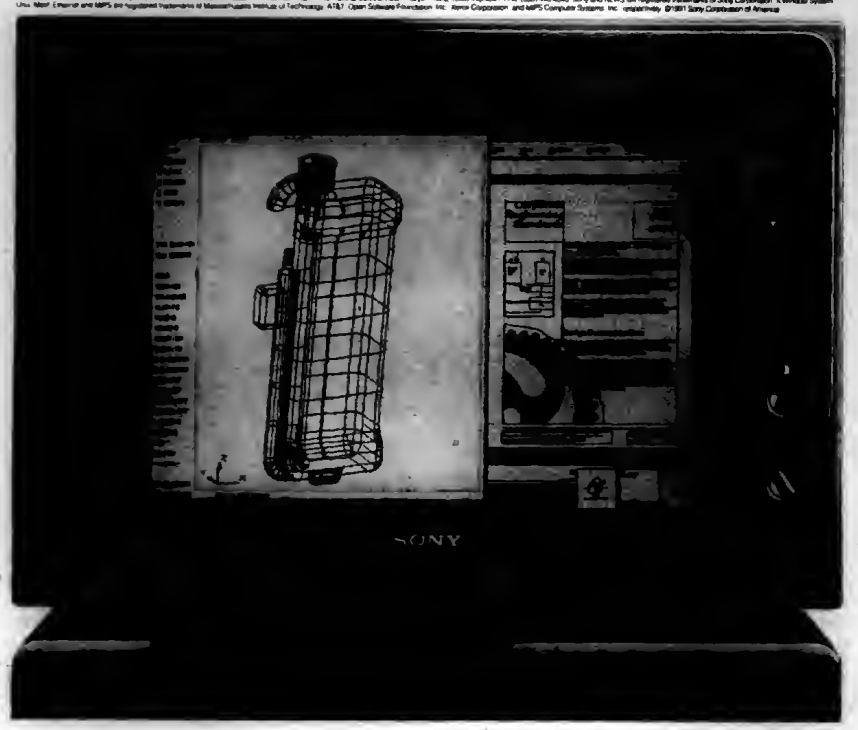

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Patent office reviews Hyatt chip filing

BY MAURA J. HARRINGTON
CW STAFF

WASHINGTON, D.C. — The dispute over who invented the single-chip microcomputer reignited last week when the U.S. Patent Office agreed to re-examine the patent it awarded to independent inventor Gilbert Hyatt last summer.

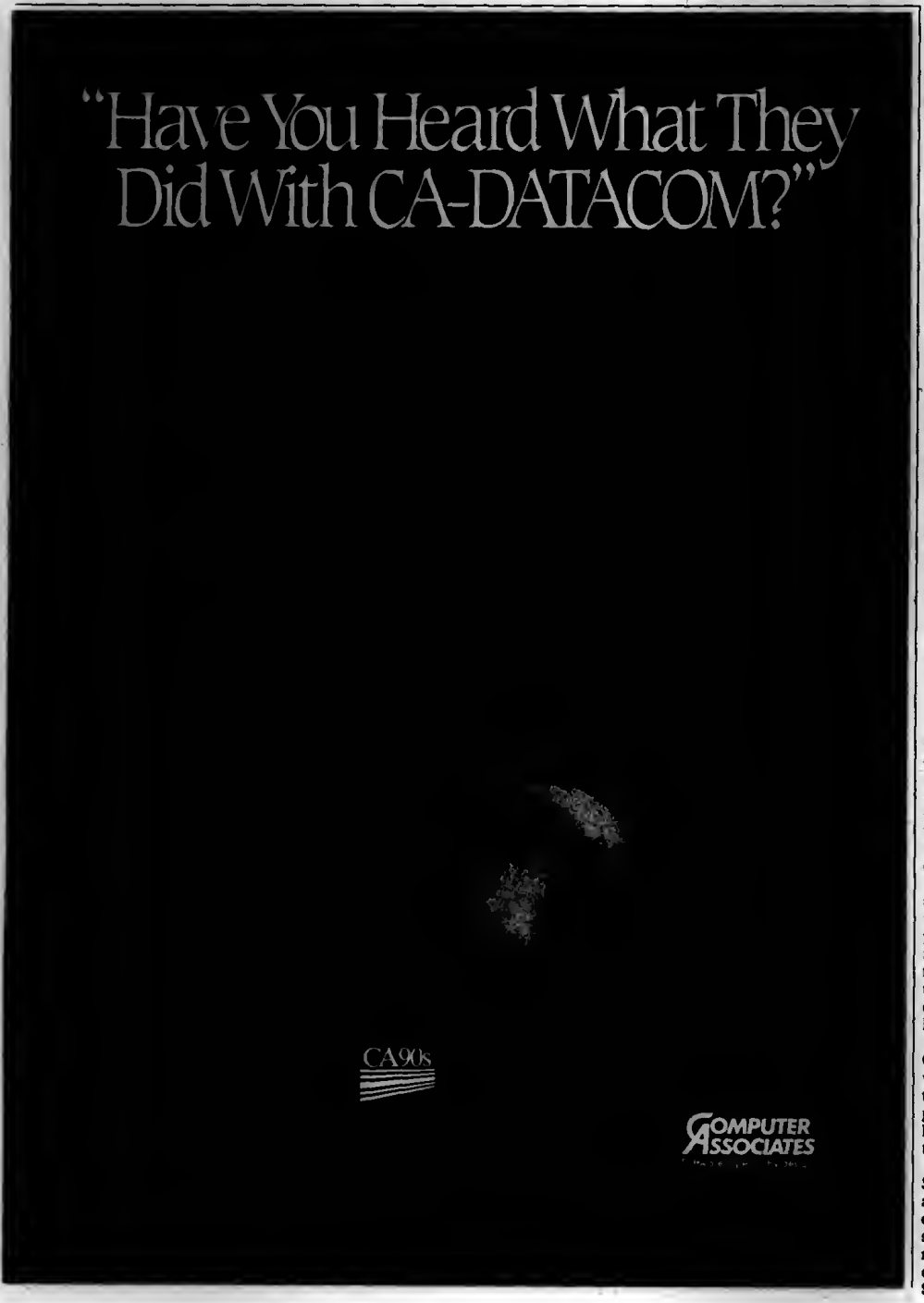
Texas Instruments, Inc. requested the Patent Office proceeding on the basis that Hyatt's original filing date, as recorded on Patent Office documents, goes back only as far as 1977, whereas a patent filed by Gary Boone, a former TI employee, dates back to 1971, according to a TI spokeswoman.

The Patent Office proceeding, called an interference, will focus on determining which party filed its patent first.

Hyatt said in a telephone interview at his home in La Palma, Calif., last week that he has been expecting opposition from TI over the patent and is ready to defend himself. He also claimed to have proof that his original patent filing date was in December 1970 and that the 1970 filing date is still valid.

"It's already been decided by the Patent Office and by the U.S. Board of Appeals that I have the 1970 filing date," Hyatt said, adding that TI "can try to get behind my 1970 [filing] date, but they can't get behind my 1968 invention date."

"There has been great dispute and controversy surrounding the issuance of the Hyatt patent . . . and it could take several years before the dispute is solved," said Gary Hecker, a partner at Los Angeles-based law firm Hecker & Harriman.



Microsoft ups support

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Windows 3.0 developers who have discovered that building applications for the much-vaunted interface is more complicated than they originally bargained for will now be able to beef up and custom-tailor support options with Support Advantage, a multitiered subscription service that Microsoft Corp. unveiled last week.

Although Support Advantage is targeted at developers, Microsoft officials said hardware manufacturers and corporate help-desk staffers could also benefit from the services it provides.

The new program replaces the one-size-fits-all Online support package that has been a mainstay of Microsoft developers since it was introduced more than two years ago, said Greg Goff, group marketing manager for product support.

Support Advantage includes three degrees of support: Solution, Professional and Premier.

The Solution level is a pay-as-you-go service for customers needing occasional technical assistance, while the Professional option provides unlimited service requests, a 24-hour callback and telephone support. Premier class service includes unlimited telephone support for developers, independent software developers and hardware OEMs.

"I'm glad to see that Microsoft has acknowledged that there are certain configuration problems that require a little more than Online was able to offer," said Howard Sobel, executive director of the National Windows Users Group Network in Media, Pa.

All three levels include the Online for Windows package, which allows developers to electronically query Microsoft's support staff. The service can also be used to access a database of technical product information.

The subscription price for the Solution level is $795 per year and includes five service requests. Professional service starts at $1,295 per user for six months of support. The Premier option ranges in price from $9,900 to $14,900 per year.

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Fed's document loss prompts security upgrade

BY JIM NASH
CW STAFF

The discovery that thousands of sensitive reports may have been lost has prompted the U.S. Department of Energy (DOE) to pursue a centralized, automated document tracking system and a general upgrade to security procedures at all DOE offices.

General Accounting Office investigators issued a report late last year revealing that 12,000 classified documents could not be located at the DOE's Lawrence Livermore National Laboratory in Livermore, Calif. It was the latest in a series of internal and external government audits of the department's ability to track paperwork, at least some of which contains closely guarded military secrets.

"I would characterize this situation as extremely important and serious," said Malene Wagner, project manager of classified document control at Lawrence Livermore. It is not a crisis, she said, because "there is no evidence that anything has walked out the door."

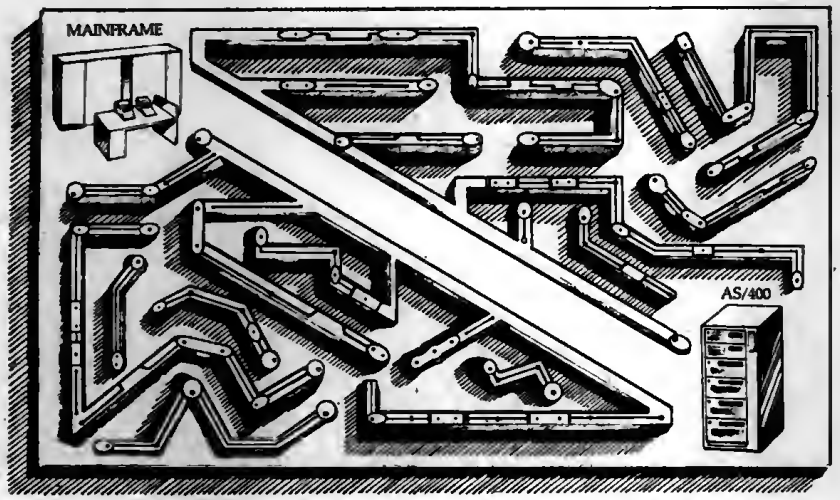
Although all DOE facilities and laboratories are under increased pressure to locate their entire inventories of secret documents, the focus has remained on Lawrence Livermore. A spokeswoman for Argonne National Laboratory in Argonne, Ill., for example, said, "1987 was the last time we went looking for something and couldn't initially find it, but the document was located." She said she was not aware if regular audits are conducted on the Argonne laboratory's manual tracking system.

A DOE spokeswoman said that because such a large portion of work done at Lawrence Livermore is defense-related, it has the largest store of classified documents of all DOE facilities. She said it is not yet clear what form the automated tracking system will take. No such system — manual or computerized — currently exists for the DOE as a whole. Lawrence Livermore, however, is in the midst of setting up its own system.

Wagner said all new and existing documents are being identified with bar codes and recorded in a Hewlett-Packard Co. HP 3000 system running Speedware, an HP accounting application. Software developed in-house will soon begin correlating "fuzzy matches," she explained.

Lawrence Livermore had followed the DOE's model until about three years ago. Wagner said the lab had previously allowed each of its 108 departments to account for its own documents — a practice that played a part in the paperwork confusion. In the 38 years since the lab was established, Wagner said, some documents have been misfiled, misidentified or not returned to their proper home.

The 12,000 documents that were originally cited as missing represent 1% of the lab's total inventory of papers. To date, 2,000 have been accounted for, according to Wagner. About half of those were found to have been destroyed but were not recorded as such, and about 500 were misfiled. The rest, she said, were attributed to input errors.



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Convex feels profit pinch

BY NELL MARGOLIS
CW STAFF

RICHARDSON, Texas — The worldwide economic slowdown will end a record 22-quarter streak of earnings gains for minisupercomputer vendor Convex Computer Corp., the firm announced last week.

However, one analyst who closely follows the firm said the record is the only thing about Convex that is broken.

With revenue split roughly 50/50 between the U.S. and the international market, Convex Chief Executive Officer Robert Paluck said, "There is increasing evidence of pricing pressures and delays in the customer's decision-making process. We attribute the slowing of our growth to those macroeconomic conditions."

The firm, Paluck said, is likely to post first-quarter earnings in the 15 to 20 cents-per-share range, under the 20 to 23 cents per share projected on Wall Street. Quarterly revenue, Paluck said, will probably go down slightly or be flat.

"Convex is a superlative company with exemplary management and a product that is the best in its market," said Mardon Navalta, an analyst at Dallas Securities Corp., a regional brokerage firm. When the economy begins to recover, he said, Convex's quarterly increases will begin building again.

In fact, several analysts said, Convex may not have to wait for the economy. The company said that on May 7, it will formally announce its third-generation supercomputer system, the C3. The long-awaited entry, expected to be based on gallium arsenide semiconductor chips, is "a major reason for our optimism about our prospects for the future," Paluck said.

The C3 system is also expected to buck Convex from the minisupercomputer to the supercomputer market, a move that will likely increase the firm's competition with Cray Research, Inc.

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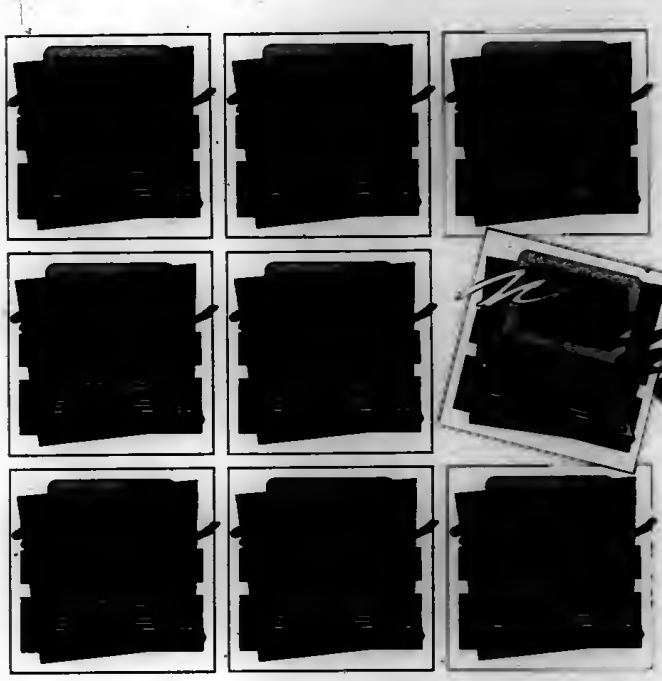

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TECH TALK

Programs for pacifists?

■ Dyna3D, a computer program developed at the University of California Lawrence Livermore National Laboratory for weapons research, is being put to use in more benign pursuits. The computer code models the stress caused by the impact of missiles and other ordnance on metal. However, bioengineers recently discovered that the program can also be used to model the stress of surgical procedures and injuries on human tissues as well as to design medical equipment.

Four-cylinder computers

■ Existing computer architectures are like four-cylinder engines running with only one spark plug, according to David Methvin, president of Davin Computer Corp. in Irvine, Calif. The solution, he said, is to add three more spark plugs to the engine. The company recently received a patent for what it calls "parallel byte processing," a technology that allows single processors to parallel process four bytes at a time. The technology could be used as a "midlife kicker" for older architectures, Methvin added.

Make mine multi

■ The typical corporation in the year 2000 will be based on seven "multis," according to Craig Fields, president of Microelectronics and Computer Technology Corp. It will be multisite, multicountry, multimedia, multiproduct, multicompany (with companies cooperating in some areas and competing in others), multi-industry (with companies linked to insurers, attorneys and many others who provide services and products), and multigenerational (with the continuing training and retraining of employees). Global networks will enable businesses to compete less on product quality and more on the ability to cope with financial, environmental and other intangible challenges, Fields said.

Mapmaker takes high-tech road

Newly developed software brings better visual graphics and greater accuracy to maps

BY MICHAEL ALEXANDER
CW STAFF

Mapmakers are heading in new directions thanks to computerized cartography. Hammond, Inc., a Maplewood, N.J., company that specializes in publishing world atlases, for example, has devised a cartography system that enables the company's mapmakers to automatically create eye-catching maps of anywhere in the world in any projection or scale.

"We created two major pieces of software: one that intelligently smooths data to keep details from crashing together [when a map is scaled down] and the other to enable us to set type in a dense manner and in a way that is aesthetically pleasing and technically correct," said Dean Hammond, president and chief executive officer of the company that bears his great-grandfather's name.

Computerized mapmaking also allows cartographers to create maps that are more accurate with less distortion, which is inevitable in maps depicting large areas. "When you take a spherical object [a globe] and squash it flat, you introduce linear, aerial and angular distortion," Hammond said. Computers enable the mapmaker to try out variations to determine in advance how much distortion is permissable.

Cartographers are still wrestling with developing a system that allows them to easily and precisely tag labels onto their maps. Most are still manually placing type on their maps, a task that can take days to complete.

Jim Mower, an assistant professor of geography and planning at the State University of New York at Albany, is working on an electronic mapmaking system that will enable cartographers to automatically label map features according to a predetermined set of rules. Often the label takes up more space on a map than the feature it is intended to identify, making positioning labels properly difficult and time-consuming.

Paul Finch

Mower has developed a map-labelling program that places labels according to population density, the type of feature depicted and other criteria. "Assume that you have a discrete number of point features — each city is represented as a dot on the map," Mower said. "The first stab at it, you could set the defaults to place labels at the upper right of each point. From that point on, [the program] starts doing conflict resolution: If it finds labels overlapping based on the point symbol it has to determine which is more important."

The strategy of allowing labels to battle for position on a map is being examined by other researchers who believe the technique may allow them to do a better job of cramming circuitry onto a chip or board.

The program may also assist electronic mapmakers in developing maps for automobile and other mobile vehicle navigation systems. Instead of wrestling with a folded map, a motorist could simply refer to a computer display mounted in the automobile's passenger compartment, for example.

Consumers could use an automated mapmaking system "to design and produce maps on the fly," Mower said. At an airport auto rental counter, motorists could key into the system a destination, either a major hotel or the home of a friend, and create a map on the spot with detailed directions.

The program was originally written for a Unix-based minicomputer and was later ported to a Sun Microsystems, Inc. workstation. Even on the workstation, it took the program as much as 30 minutes to place a single label on a map of upstate New York. Mower rewrote the program for a parallel processing computer built by Thinking Machines Corp., and it is now able to place each label in three minutes.

Software keeps new workers out of the dark

BY MICHAEL ALEXANDER
CW STAFF

The first day on any new job is tough enough, but what if you walked into the middle of a massive construction project where every moment's delay cost thousands of dollars? That is basically what many military personnel in the U.S. Army's Corps of Engineers — who are shuttled to new assignments every few years — must contend with.

Researchers at the Georgia Institute of Technology in Atlanta have developed groupware software that is intended to help reduce the learning curve for newly assigned office workers managing the Army's $1 billion annual construction program.

"When a person comes into a new position in a fairly fast moving environment, he often finds that there are reports overdue, but he doesn't have a clue how to get the reports done," said George Olive Jr., senior research scientist at Georgia Tech's Construction Research Center at the College of Architecture. What was needed was a program that could be used "to keep track of projects until the new employee was up to speed," he said.

The program, which is called the Knowledge Worker System, was developed under a contract to the U.S. Army's Construction Engineering Research Laboratory.

Knowledge Worker System, which runs on an Intel Corp. 80386-based personal computer under Microsoft Corp.'s Windows, "captures institutional knowledge," Olive said. With information culled from his predecessors, the new employee is able to prioritize what tasks must be completed and gather the information needed to complete the tasks. The program is driven by a master calendar that lists major milestones and automatically links the assignments of every employee working on each project.

The program begins with a window that has a to-do list of key assignments or critical deadlines on a project. "Click on an item and up comes another window with more detail, perhaps a set of steps on how do an item, with forms, routing sheets and other supporting documentation," Olive explained. Because the package operates on a network, the worker can send electronic mail, route documents and query databases, among other tasks. Many steps can be automated and carried out with only a few mouse clicks, Olive added.

Knowledge Worker System, which took about two years to complete, will be installed next month on a network of 15 PCs at the Corps of Engineers office in Washington, D.C.

The researchers recently began working on a more sophisticated program based on an expert system that is closely tied to the jobs of information workers in the corporate world.

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EDITORIAL

Free enterprise

NOW LET'S SEE if we've got this straight. IBM and Microsoft have agreed to disagree and each go their own way in promoting the desktop operating system of the future. Microsoft will aggressively enhance and promote Windows and develop a portable version of OS/2. IBM will enhance and promote OS/2 and keep its options open on adopting Windows. Users will have two choices and will have to make up their own minds.

What in tarnation is wrong with that? Not much. Then why do so many people see this situation as disruptive to the industry?

It's because the PC software market has been living in a fantasy world for the last four years. It was a world in which everyone pretended to agree that the desktop was going in a single direction, despite every indication to the contrary. It was a world that Microsoft thankfully shattered two months ago when it declared that maybe OS/2 wasn't going to be the only game in town.

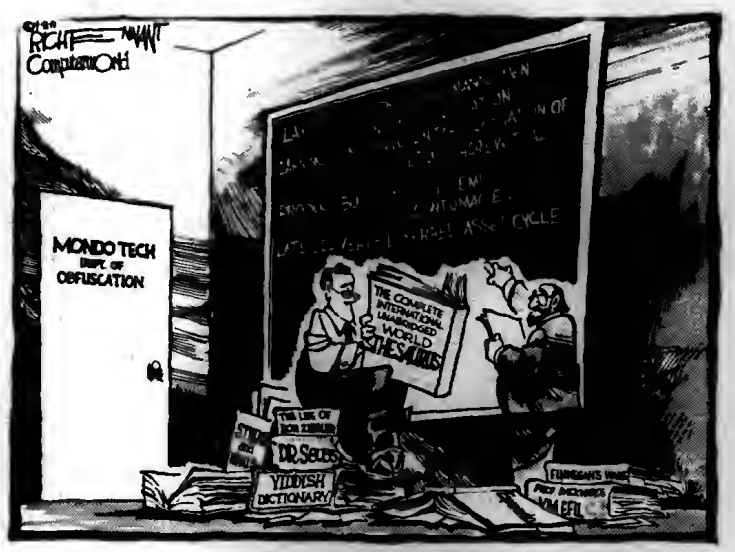
Now we've got a barn burner going. Since the split between the two PC giants became public, both have hit the road pledging to quickly fix whatever ails their products, promote the heck out of them and court independent developers. It's good old American competition at its best. Why did it take four years to happen?

Because for four years there's been no pressure. It has been enough for both IBM and Microsoft to release a "statement of direction" and pursue it on whatever time frame was convenient — no competition, no incentive.

That's been a popular approach with software vendors, who have plenty to gain by having only a single interface to write to. Not surprisingly, most of the pressure on IBM and Microsoft to kiss and make up is now coming from that same group. They cringe at the thought of spending extra time and money duplicating their software on two different operating systems.

Unfortunately for them, the world isn't quite that simple. If it was, then DEC never would have stood a chance when it wrote a non-IBM compatible operating system called VMS for its computers. But it did stand a chance because the strength of its products and enthusiasm of its customers attracted independent software vendors in droves. No one is seriously pushing DEC to make VMS IBM-compatible. Heck, no one is even pushing IBM to make its own Application System/400 IBM-compatible.

True, there will be effort duplicated and dollars wasted as a result of the desktop schism. But there will also be two very good companies competing vigorously to make their products better and market them more aggressively. Customers will ultimately choose which operating system they want to adopt, knowing that neither the OS/2 Presentation Manager nor the DOS Windows decision is likely to be a bad one. Software vendors will do what they do best and follow their customers' dollars. IBM and Microsoft will bring their technologies together if the market demands it. It's called competition — and it works.



LETTERS TO THE EDITOR

Not-so-expert

I feel that your readers are being misled by the comments of your so-called "experts" in the multimedia field. I refer specifically to the interview with John Diebold [CW, Feb. 25].

Multimedia is a concept, not a piece of hardware, and it *has* been available on "widespread and inexpensive machines" for years.

Furthermore, the current crop of "multimedia" hardware is a stopgap technology to a future — and far more useful — class of hardware.

Good interactive programmers are hard to come by. But when it all comes together, well, it's wonderful.

Russell Hoffman
P11 Enterprises
Los Angeles, Calif.

Windows warning

I couldn't help but be amused by your confused article titled "Complexity lurks for Windows programmers" [CW, March 18]. Certainly any programmer attempting to use icons to implement "a string of separate commands" is going to have a hard time. Icons are used to represent programs and data files. Graphic buttons are sometimes used to initiate an operation or change a mode (for example, selecting a brush style or color in a graphics program). Command strings generally emerge as menu selections.

As many programmers involved with the early days of the Macintosh can tell you, porting an existing program to an object-oriented environment is a sure-fire formula for disaster. Existing "procedural" programs are often poorly structured and attempting to shoehorn one into an object environment serves mainly to expose its design flaws. It is best to redesign the system to the object paradigm. Occasionally, it is possible to port code directly. However, this happens much less often than one might expect.

The best advice that one can give teams struggling to adapt to Windows and event-driven, object-oriented programming is "get expert help." After all the training classes, videotapes and code examples have been finished, swallow your pride and find an experienced Macintosh programmer to help you through the first difficult months. Remember, it was no easier for us to learn this new style of programming — but we've been doing it for almost seven years."

William L. Colsher
Stamp Computer Services
Eden Prairie, Minn.

Know thyself

Regarding "Fuzzy logic clarified" [CW, March 11], the early 1960s concepts of "pattern recognition," "heuristic programming," "computer simulation of thought processes," have re-emerged under the chest-pounding of fuzzy logic. With this revived interest in the notions of vagueness and ambiguity, we face the periodic opportunity to make decision-support applications really flourish through research aimed at understanding the process of decision-making.

A phenomenon is not apt to be discovered that is fuzzier than that of a human being arriving at decisions. Individuals are partially structured in terms of their preconceptions; hence, their strategies and judgments in a particular problem-solving and decision-making situation vary accordingly, not only between individuals but within oneself. A given stimulus may be ambiguous relative to the possible set of concepts which it could activate, but the relationship takes on clarity upon specification of the environment.

Its documented shortcomings not withstanding, the most fertile field in which to cultivate an understanding of an individual's decision-making process is the one of introspection. Who is in a better position to analyze the organization of mental processes involved in a problem solving situation than the problem solver himself? What is needed is a conceptual framework that combines introspection as the approach and fuzzy logic as the vehicle for providing a logical foundation and outline for guiding research toward the understanding of decision-making. The result should be the development of a series of fuzzy logic computer modules, each characterizing some fundamental aspect of an individual's process of making decisions — the substance of the modules to be arrived at through introspection.

John H. King
School of Computer and Applied Sciences
National University
San Diego, Calif.

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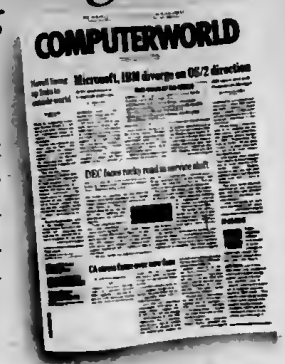
   21. Dir./Mgr MIS Services, Information Center
   22. Dir./Mgr. Tech Planning, Adm. Svcs., Data Comm. Network Sys. Mgmt. Dir./Mgr PC Resources
   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31. Mgrs., Supvr. of Programming, Software Dev.
   33. Programmers, Software Developers
   09. Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
   11. President, Owner/Partner, General Mgt
   12. Vice President, Asst. VP
   13. Treasurer, Controller, Financial Officer
   41. Engineering, Scientific, R&D, Tech. Mgt.
   51. Sales & Mktg. Management



   OTHER PROFESSIONALS
   76. Medical, Legal, Accounting Mgt
   99. Educator, Journalists, Librarians, Students
   99. Others _____ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant
   A. Mainframes/Supermins
   B. Minicomputers/Small Business Computers
   C. Microcomputers/Desktops
   D. Communications Systems
   E. Local Area Networks
   F. No Computer Involvement

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What you don't see can hurt you

Changes in the telecommunications sector may catch computer vendors off guard

VICTOR SCHNEE

Vital interests of computer firms are at stake in a massive restructuring that is about to take place in the telecommunications industry.

As I first pointed out in a study released late last year entitled "Taking Over Telephone Companies," the monopoly enjoyed by local telephone companies is about to crumble, unleashing forces that will completely destabilize the telecommunications industry.

While this change is likely to occur within the next two to five years, well within the range of any normal short- to intermediate-term planning cycle, the computer industry has not planned for it and is not yet prepared to take advantage of it. Nor is the computer industry, which recently learned from AT&T's pursuit of NCR that aggressive telecommunications companies view it as a target, ready to defend itself. Much ground must be covered quickly.

Local telecommunications service demand growth has been utterly anemic, generally only 2% to 3% per year, regardless of which measure is used. Plant modernization has failed to address the needs of an increasingly devices-driven future (many of the devices being supplied by the computer industry). And monopoly thinking vitiates any attempt by these companies to mount a credible market-driven approach to their future.

The days of local monopoly are clearly limited. Competitive incursions are already mounting. There has been an erosion of belief in the idea of "natural monopoly, long the industry's ideological bulwark. New technologies such as wireless networks reduce the value of telco access. Furthermore, just a short way down the road — two to three years — there looms the end to the AT&T consent decree restrictions on the regional Bell operating companies.

There is a vast amount of capital worldwide ready to jump into virtually any telecommunications services opportunities. Once legal barriers to full competition are dropped, truly competitive local networks are likely to evolve as a combined result of this availability of capital, new business strategies, new technological alternatives for provision of access and intelligence and new services growth opportunities.

The introduction of truly competitive local networks will constitute one of the most profound strategic changes ever in the information technology industry. Distinctions between "local" and "long distance" businesses will fall, as will prohibitions on telephone providers entry into CATV.

Moreover, ending telephone company monopolies is going to unlock a communications services growth potential that vastly exceeds common forecasts. This did not happen with the advent of purely long-distance competition because access to the broad customer base for advanced services capabilities remained largely bottlenecked at the local level. The services explosion will rebound to the great benefit of producers of all types of communicating devices.

This services proliferation is basically good for computer companies. However, sitting and waiting for it to happen is not a sound strategy. Aggressive, restructured telephone companies will, for example, not hesitate to take over computer companies.

Christoph Albrecht

Computer companies need to figure out which areas of growth resulting from telecommunications restructuring will offer them the most benefit. They also need to address the possibility of their own direct entry into the services and network markets, public as well as private.

I am well aware that by the late 1980s it became a rote response for computer majors such as IBM to state that they had no interest in entering "the telephone business." IBM, specifically, may have been overly discouraged about the results of its past telecommunications forays. The fact is, however, that IBM never addressed the most vital area of potential interest to it — the service-enabling local networks.

With telecommunications industry restructuring now in the offing, this disinterested posture can seriously work against the interests of computer companies. The opportunities and returns in the network business are likely to dwarf traditional computer business opportunities as advanced services markets soar over the next two decades.

Furthermore, it is very likely that during this time we will see the creation of one or more network-based, integrated information technology superpowers. The potential for such successful network companies to impede, exclude or acquire even powerful, entrenched computer companies will be very real.

Awareness, preparedness and boldness are all needed by the computer industry now. At stake is not only the issue of who drives the pace of telecommunications restructuring but who participates in and dominates new information technology markets that will result. If computer companies begin now and act aggressively, their role in the restructured telecommunications industry could range from being major device, software and system suppliers, to being co-venturers in new services to becoming acquirers of telephone companies.

Schnee is president of Probe Research, Inc. in Cedar Knolls, N.J.

Japan's software threat: a U.S.-made paper tiger

CHARLES P. LECHT

The American Electronics Association (AEA) in Tokyo recently sponsored a talk by MIT Sloan School Associate Professor Michael A. Cusumano, famous for his work in analyzing software productivity in America and Japan. Cusumano was in Tokyo promoting his new book, *Japan's Software Factories*, which looks at software production skills in some 40 companies in the U.S. and Japan.

In his talk, Cusumano suggested that Americans have a misconception about Japanese software productivity skills. Contrary to popular opinion, he said, Japanese people are really skilled in software production. Their productivity is around 50% to 70% higher than their American counterparts, and the results of their work are about 33% to 50% more error free.

Although Cusumano admitted that the measurement methods he used to reach these conclusions are controversial at best, there was nothing ambiguous about his message.

Japanese programmers are better organized, less hampered by creative temperament and more willing to create reusable software modules than their American counterparts, according to Cusumano. Futhermore, he suggested, the reputed Japanese drive for efficiency has managed to move the task of programming from that of a craft to "a more productive fruitful factory approach."

Under attack

As a result, he said, there is no doubt that Japanese software companies will soon mount an assault on the U.S. marketplace. Exhibiting a sanguine if not morbid sense of humor, he suggested that when Japanese companies start to penetrate the U.S. software marketplace, their products will arrive like "Scud missiles."

This imagery no doubt stimulated the superpatriotic nervous systems of Tokyo's AEA membership, which is already disposed to believe that the Japanese have a sinister plot to undermine any U.S. lead in things technological.

I have my own suspicions, however, about the motives behind statements of this kind. I've heard this kind of thing before, almost always as prelude to a fund-raising effort of some kind.

In the early 1980s, we were informed by one expert after another of the "Japanese threat" to American supremacy in high technology. Back then, it was the so-called "fifth-generation" Japanese computer. We were told that unless more government money was invested in American research, the reputed Japanese industrial machine was going to unite to capture America's lead in computer and communications technology.

What Americans were not told was that the entire fifth generation computer budget allocated by the Japanese government for over five years was not even a minuscule fraction of what the U.S. government was spending on U.S. Army research in the same area. Also absent from the experts' calculations was the fact that uniting Japanese industry in the manner envisioned was about as likely as a marriage between George Bush and Saddam Hussein.

But the campaign was effective. Incredible amounts of moneys were raised, semigovernmental organizations were created, and American taxpayers paid the bill.

Then there was the spectre of semiconductor dumping or underselling, which was used as a basis for creation of a taxpayer-funded consortium to thwart the Japanese. From over here, it appeared as though Americans were frightfully worried that the Japanese might wake up one day and decide to give away their semiconductor production free and thus blitz the U.S. computer industry in this nefarious way.

Empty threats

Now, after a number of other scares, including a brief flurry over the "Tron threat," we have the "software threat." This is despite the fact that there isn't one notable, commercially available, off-the-shelf, mass-published Japanese software product in the American marketplace.

Sure, there is the Nintendo game stuff and other custom software such as that found in the computer-aided software design and engineering and communications arenas, but give me a break. Every successful Japanese computer, from laptop to mainframe, is running basic software made and/or designed in the U.S. The only exceptions are packages for applications that are heavily dependent on the Japanese language or heavily oriented toward text manipulation, such as electronic publishing.

I mention all this not to demean Cusumano's work. Doubtless, it is packed with beneficial information. What I am saying is, let's not overreact. No matter what the extent of improvement in Japanese software development skills, the only software threat U.S. companies may face from Japanese companies for the foreseeable future is the export of software previously imported from, you guessed it, America.

Lecht is an IDG News Service correspondent based in Tokyo.

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NEW DEALS

CDC finds takers

Control Data Corp. recently announced three new takers for its Cyber 2000 mainframe. The University of Western Ontario, Germany-based Volkswagen AG and aircraft engine supplier Garrett Engine have all signed orders for the firm's top-of-the-line Cyber product. The contracts are worth more than $20 million in total.

CDC will increase its presence south of the border with a contract in excess of $10 million to supply 179 CDC 4000 computers and peripherals to Mexico's national electric utility. The Comision Federal de Electricidad will use the reduced instruction set computing (RISC) workstations to automate distribution of the country's electricity.

Littleton, Mass.-based **Alliant Computer Systems Corp.** announced that Michigan Technological University has taken delivery of two FX/series RISC-based supercomputers for use in research on fluid dynamics and other fields. The supercomputers will be connected via fiber optics to all Michigan universities. Alliant also announced the U.S. Air Force has installed an FX/2800 for avionics research and flight simulation at Wright Patterson Air Force Base in Ohio.

Prime unveils Information SQL interface

Designed for use as a bridge between computer vendor's proprietary and Unix-based systems

BY SALLY CUSACK
CW STAFF

ANAHEIM, Calif. — Prime Computer, Inc. introduced a SQL interface for use with Prime Information and Prime Information Plus database software products at the International Spectrum show last week.

Called Information SQL, the software offers data query and update interface capabilities for Prime Information users on both the proprietary 50 series minicomputer and Unix-based Prime EXL system platforms.

The PI Plus database management program uses a Pick-like operating system architecture and is a C language implementation of Prime's Information fourth-generation language database software for Unix environments.

Kina Leitner, chairman of the National Prime User Group's (NPUG) Prime Information special interest group, said a large percentage of Prime Information users need SQL functions, particularly in multiple-vendor sites requiring a common software interface.

Safe bet

"It is safe to say that there are 20,000 Information users worldwide," noted Gerry Feeney, an information systems consultant at Milestone Systems, Inc. in San Francisco. Feeney, who is a former NPUG president, agreed with Leitner that the biggest draw for the Information SQL product will be in multi-architecture shops.

John Nakos, director of financial information systems at the University of Southern California (USC) in Los Angeles, has been beta-testing Information SQL and said he finds that "as a reporting tool, it works perfectly."

Nakos estimated there are approximately 100 users at USC who are "SQL literate" and said USC will use the product to bridge users on Intel Corp. 80386-based clones running Informix to the Prime 6650 minicomputer.

This will allow professors and other staff members who are familiar with SQL to directly access data residing in Prime Information on the minicomputer and create ad hoc reports.

"We haven't used the update features yet," Nakos said, "but the data retrieval functions are quick and effective. Whoever wrote the program did a good job."

The product provides four basic SQL data manipulation operations defined under the SQL standard: Select, Insert, Update and Delete.

The package also allows Information SQL users to treat each value in a multivalue field separately. Users will have the ability to read, modify and query PI Plus databases using standard SQL commands.

Prime's Information SQL is priced from $125 for the Prime EXL series and from $1,500 for the Prime 50 series, depending on number of users.

Shift from older minis to AS/400 increases

BY MARYFRAN JOHNSON
CW STAFF

LA JOLLA, Calif. — More IBM customers are tramping down the migration path from the System/36 and System/38 midrange families to the Application System/400, according to Computer Intelligence.

The market research firm, based here, recently reported that half of all newly installed AS/400s are replacing old faithfuls from the System/36 and System/38 world.

"Over the last 2½ years, the IBM AS/400 has proven to be a huge success as the follow-on to the System/3X family of midrange systems," said David Eulitt, an analyst at Computer Intelligence. He noted that as of July 1990, at least 16,000 of the 32,000 installed AS/400s were replacements for System/36s or System/38s.

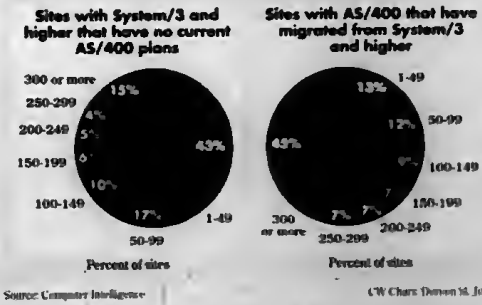
The Computer Intelligence research, however, found that the 80,000 or more System/36 and System/38 users who have stayed put feel no pressing need for more processing power and are happy with the ease of maintenance on their older systems.

In analyzing the users who migrated and those who dug their heels in, Computer Intelligence found a heavier concentration of medical/education, process and discrete manufacturing industries among the migrators. Those keeping the old systems tended to fall into the wholesale/retail and financial/insurance industries.

The ideal candidates for migration, Eulitt said, are those with growing numbers of personal computers on the premises and those who must boost their storage capabilities. In the Computer Intelligence study, 47% of the users who migrated to the AS/400 had 4G bytes or more of storage capacity.

Bigger company, bigger system

Application System/400s are more often located at companies with large personnel counts



Source: Computer Intelligence

CW Chart: Doreen M. John

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VAX system helps HMO improve patient care

ON SITE

BY JEAN S. BOZMAN
CW STAFF

CYPRESS, Calif. — Tuning your database is a serious business. Pacificare Health Systems, Inc., one of the largest health maintenance organizations (HMO) in the U.S., has spent a lot of time and money doing just that largely because the nearly $1 billion HMO, with an information systems budget of more than $15 million, "lives and dies" on its relational database.

Maintaining patient profiles and billing information on Pacificare's Digital Equipment Corp. Vaxcluster requires vast amounts of data — including a main database of 6.3G bytes — and demands response times of three seconds or less. At the heart of the company's all-VAX computer room is the RDB 3.1 relational database management system, which is growing at a rate of more than 1% per week.

"The key to our shop is pushing performance," said Richard Kislowski, vice president of information services at Pacificare. "We want the hardware, the operating system and the database to squeeze every last ounce of performance out of our Vaxcluster." Peak loads on the production database have hit 40 transactions per second, and transactions total 200,000 or more per day.

A system upgrade

The firm's quest to pare response times — with an ideal of subsecond response times somewhere in the long-term future — and greater capacity led it to install DEC's largest VAX system, a VAX 9000, in July 1990 and to upgrade that Model 210 to a Model 420 last fall. The VAX 9000 anchors a four-node Vaxcluster; the other nodes are two VAX 6540s and one VAX 6430.

Leo Collins, Pacificare's director of information services, noted that the Vaxcluster "sort of looks like trail mix at this point," with hardware of various sizes. However, each machine runs the same release of the VMS operating system and the same RDB 3.1 software. A fifth VAX is used offline to test new software, Kislowski said.

Fueling the processing demand is the fact that Pacificare has been growing at a fast clip during the last five years, boosting its membership to 700,000. Acting as an umbrella organization that operates HMOs throughout the West, Pacificare's revenue climbed from $169 million in 1986 to $976 million at the end of 1990.

The firm sometimes has 900 users logged onto its Vaxcluster, nearly 500 of them on the VAX 9000. An IS department of 110 employees, including 70 programmers, manages the data infrastructure.

Alan Levenson

McGinness (left) and Collins *are using RDB on VAX systems to speed Pacificare's database access*

New hardware, particularly the VAX 9000, pushed response times down from an average of four seconds in 1989 to three seconds or less. Running the primary RDB application entirely within the VAX 9000 machine helped to fine-tune the database performance.

By assigning different tasks to each of the four VAXs, Pacificare's IS department reduced the amount of intranode communications. End users only have to log onto one machine, though, to access all Vaxcluster services, including RDB access, electronic mail and office automation packages. Custom Pacificare programs make the routing of data requests around the cluster transparent to the end user.

If the VAX 9000 failed, the RDB data would still be accessible by the other three attached VAX machines through the cluster's shared disk memory. Pacificare has more than 100G bytes of disk drive capacity, with 12G bytes of that storing mirrored copies of the production database.

On to 4.0

Pacificare plans to migrate the Vaxcluster to RDB 4.0, the latest version of the DEC RDBMS, later this spring, about a year after Pacificare migrated to RDB 3.1 from RDB 3.0.

"We're not banking on a performance increase," said David McGinness, database administrator for RDB. "But there probably will be one, due to enhancements in RDB 4.0's query optimizer."

Pacificare carefully built up its Vaxcluster systems off-line, starting in 1987, while it was still running its applications on two high-end Wang Laboratories, Inc. minicomputers, storing patient information in flat-file records. First, two VAXs were teamed up to develop the RDB applications. In the fall of 1989, the RDB system went on-line with a combination of VAX 6000s and VAX 8000s. Two VAX 8820s were changed out of the cluster when the VAX 9000 arrived, Kislowski said.

FPS unveils triple-architecture computer

BY ELLIS BOOKER
CW STAFF

BEAVERTON, Ore. — Purring under the hood of the new supercomputer introduced recently by FPS Computing, Inc. are not one, not two but three different kinds of processors.

The FPS 500 series Scalable Processor Architecture (Sparc) thus becomes the first supercomputer to deliver a triple-threat, "heterogenous" architecture able to handle scalar, vector and parallel-processing computations. It is also being billed as the first supercomputer based on the Sparc reduced instruction set computing (RISC) architecture from Sun Microsystems, Inc.

However, even with all that technology, the 20-year-old computer company will face a tough sell in the relatively small but fiercely competitive market for high-performance supercomputers, according to analysts. FPS has watched its revenue tumble from a high of $126.5 million in 1985 to $46.9 million last year.

What is more, analysts said, FPS will have only a short lead on the industry's two dominant players, Eagan, Minn.-based Cray Research, Inc. and Richardson, Texas-based Convex Computer Corp.

The choice of Sparc will enable FPS to focus its development dollars on applications and systems rather than the design of a next-generation RISC chip, according to FPS Marketing Vice President Stephen P. Campbell. In addition, he said, it opens the architecture to the 2,800 applications available for Sparc.

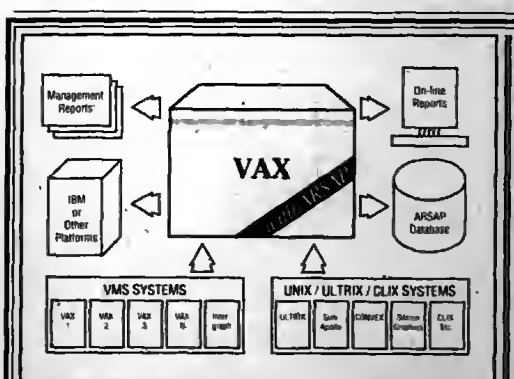
Another consideration

Another key choice, according to FPS officials, was the decision to attach the different chip types over a high-speed, 1G byte/sec. bus rather than connecting individual parallel, vector and scalar supercomputers over a high-speed local-area network. The centerplane bus, called the Scalable Interconnect Architecture, is a 1G byte/sec. pathway.

FPS also created a new compiler to accompany its high-performance computer. Jointly developed with Kuck & Associates, Inc. in Champaign, Ill., the compiler is said to take Fortran or C code at one end and optimize it for the FPS 500's scalar, vector and matrix/parallel processors. FPS has been talking about a migration from its proprietary RISC processor to the Sparc chip for more than one year, said Jeff Canin, a computer analyst at Montgomery Securities in San Francisco. "I think they'll do better than if they'd continued to push a strictly proprietary line," he said.

At the heart of the new FPS machine are three dissimilar types of processors: a 64-bit emitter coupled logic Sparc scalar processor from Sun, an FPS vector coprocessor and matrix coprocessors using up to 168 of Intel Corp.'s i860 chips.

The FPS system, which has already begun shipping, ranges in price from $450,000 to $4 million.



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IBM aims at financial services

IBM recently added six packages to its financial services arsenal including five applications packages and one that will facilitate electronic payments.

IBM also will make available OS/2 and AIX versions of its Consumer Transaction platform automation software this summer, said Thomas G. Hudson, vice president of IBM's Finance Industries Services Sector Division. IBM is also developing risk analysis and financial performance software designed to be used by global financial institutions, Hudson added.

The electronic payments package, called Netpay/MVS, was developed by Advantage Systems, Inc. in Waltham, Mass., and is based on the electronic data interchange standard. The software, for which IBM now has marketing rights, will help financial institutions generate fee-based services for existing and new customers, IBM said.

Netpay/MVS allows banks and other users to receive payment orders electronically and to prepare those orders for processing by the user's in-house payment system. The software is installed at the Royal Bank of Canada, among other institutions, Hudson said.

The other five packages are Profitability Management, Asset Liability Management, Customer Information System, Financial Accounting and Data Collection. All can be used with IBM's DB2 database management system.

Profitability Management provides information about income and expense performance, balance sheet levels, statistical volumes and performance indicators for business units. It was developed by Hogan Systems, Inc. and PNC Financial Corp. and is installed at PNC in Pittsburgh.

Asset Liability Management is a risk management and planning system for assessing the impact of interest rate movements. It allows users to project performance based on interest rate fluctuations and to do "what if" analysis. The software package was developed by Banking Decision Systems, a subsidiary of Logica Data Architects, Inc.

Customer Information System links all of a customer's different accounts and other information about the customer. Users can create multiple views of a given customer's accounts. Hogan Systems developed the software.

Financial Accounting is an interface with Dun & Bradstreet Software's general-ledger software. Data Collection allows users to gather and store data in a common format. The software was developed by Carleton Corp.

JOHANNA AMBROSIO

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Symbiosis for Storage Tek, CA

BY CAROL HILDEBRAND
CW STAFF

Storage Technology Corp. and Computer Associates International, Inc. recently announced a joint agreement that is aimed at improving interoperability between Storage Tek's 4400 automated cartridge system and several CA tape management systems.

Future hardware and software releases will be compatible, according to the companies. Mutual product testing as well as joint beta testing are also in the works as is the development of enhanced interfaces.

"We first started going after this agreement when we realized that, like it or not, CA had the vast majority of tape management systems, and Storage Tek had 95% of the robotic systems," said Gary Francis, manager of tape product marketing at Storage Tek. He said the agreement was basically a formalization of channels between the firms for contact points for support and engineering.

Some analysts expressed skepticism that CA would live up to its side of the bargain. "It sounds very good on paper, but whether or not it's actually going to work out for Storage Tek is a big question," said Alan Snitkof, vice president and director of operations and systems at New Science Associates, Inc. in Southport, Conn. "CA has been less than sterling in their ability to deliver timely software."

SOFT BITS

Pansophic airs on-line data tool

Easytrieve Plus, the flagship information retrieval and data management tool from **Pansophic Systems, Inc.**, grew with the times last month with an on-line version. Easytrieve Plus Online was described by Pansophic as a complement to the earlier batch product, now used by 7,500 companies worldwide. The software complies with IBM's Systems Application Architecture standards.

SAS Institute, Inc. in Cary, N.C., has announced that the SAS Applications System software will now support **Digital Equipment Corp.'s** DEC Real Time Test Integrator. Scheduled for availability this quarter, the DEC Real Time Integrator is a windows-based icon tool kit designed to allow users to create and run real-time applications by drawing them.

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May 8	Los Angeles St. Louis	Jun 13	Ottawa
May 9	Phoenix	Jun 14	New York Toronto
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NEW PRODUCTS — SOFTWARE

Applications packages

Computer Decisions International, Inc. has announced Version 2.5 of Microshop IV, a manufacturing management software package that runs on IBM RISC System/6000s or AIX-, Unix- or Xenix-based systems.

The software package includes an indented work-orders feature that reportedly enables users to track estimated and actual work-order costs within a job.

Pricing ranges from $50,000 to $100,000.

Computer Decisions International
39500 Orchard Hill Place Drive
Novi, Mich. 48050
(313) 347-4600

Diversified Software Systems, Inc. has announced Online Info, an operations job information product designed for IBM OS/MVS environments.

The product reportedly enables operations departments to immediately obtain information regarding what a particular job was designed to do. An on-line query facility allows users to display specific job data, such as what steps were executed and which disk and tape input files were used or created.

License fees range from $6,000 to $14,000, depending on CPU size.

Diversified Software
18630 Sutter Blvd.
Morgan Hill, Calif. 95037
(408) 778-9914

Computing Options Co. has announced Ofas/3000, a fund accounting system designed for educational institutions, nonprofit organizations and state and local governments.

Ofas/3000 includes the following modules: general ledger, budgeting, requisitions and purchase orders, accounts payable and accounts receivable. Its on-line processing feature can reportedly provide up-to-the-minute account balances and budget control information that includes data pertaining to transactions currently being entered into the system.

The software runs on Hewlett-Packard Co. 3000 computers. A limited number of packages are priced at $25,000.

Computing Options
182 Thomas Johnson Drive
Frederick, Md. 21701
(301) 662-5592

Utilities

Polestar Software, Inc. has announced Pursuit, a Help desk software package that enables users of VAX/VMS computers to track job status, locate recurring problems and view detailed management reports.

The product's centralized database serves all support personnel, and its alert feature was designed to ensure that important problems are solved promptly, the vendor said.

Prices range from $5,000 to $40,000, depending on number of active support customers.

Polestar Software
109½ W. Broadway
Fairfield, Iowa 52556
(515) 472-2445

NEW PRODUCTS — HARDWARE

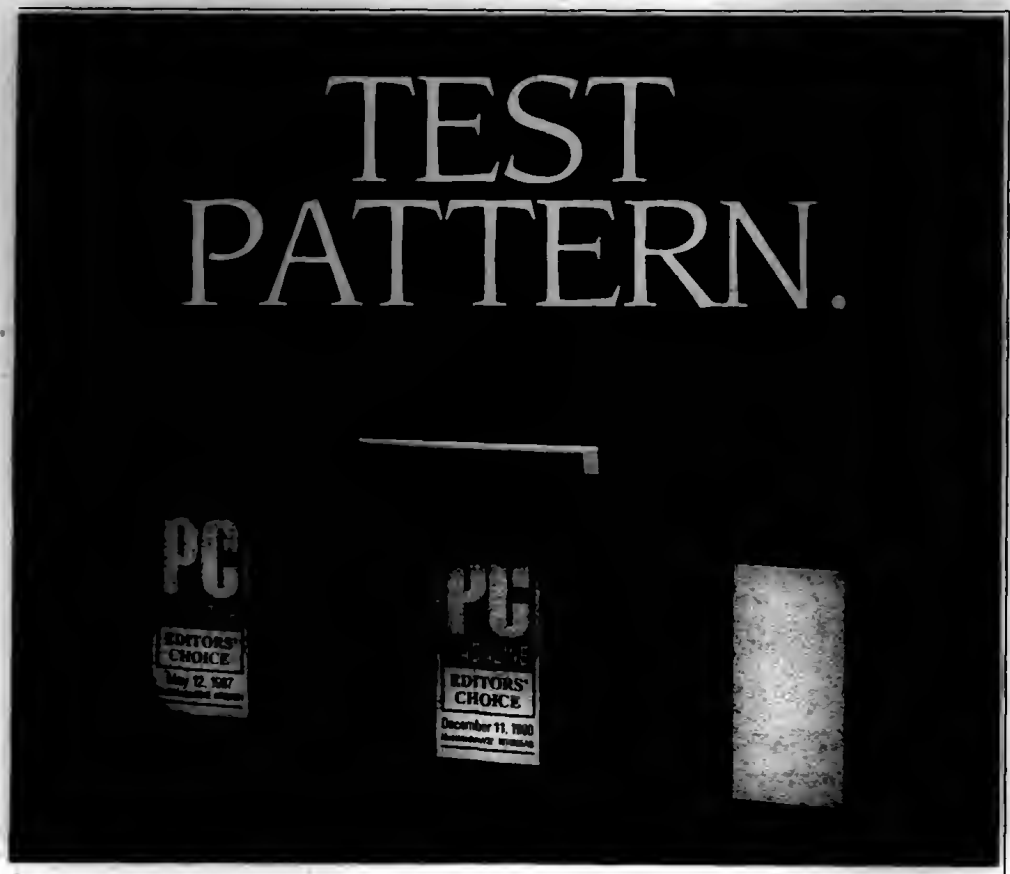
Processors

Stardent Computer, Inc. has announced the Stardent 750, a computer manufactured by Kubota Computer, Inc. in Japan.

The system includes the Stardent VX graphics subsystem, a 256M byte/sec. bus, a memory subsystem and an I/O subsystem. It also features up to 256M bytes of main memory and Ethernet connections.

Pricing ranges from $53,600 for a server configuration without a UX subsystem to $152,000 for units equipped with additional memory.

Stardent
6 New England Technology Center
521 Virginia Road
Concord, Mass. 01742
(508) 287-0100



When Multi-Tech modems are put to the test, a pattern emerges.

In the 1980's, the dial-up market was dominated by 2400 bps MNP-5* modems. Today, it's 9600 bps modems with V.32/V.42bis. Following that same timetable, PC Magazine awarded our MultiModem224E its EDITORS' CHOICE in May of 1987. In December of 1990, they gave the nod to our MultiModemV32.

Here's what they had to say:

"The MultiModemV32 can be configured for almost any application; it works under severely impaired lines, and it wins first prize for fast data transfers."

PC Magazine 12/11/90 (Ziff-Davis Publishing) "9600-BPS MODEMS: Breaking the Speed Barrier-PC LAN Labs tests seven rapid-fire modems complying with V.32, V.42 and V.42bis standards."

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WHEN YOUR career and your company's bottom line are on the line, you can't afford to work with someone who's second best. Fortunately, when it comes to computer networking, you don't have to. Because the leading expert is ComputerLand.

Surprised? Probably so. But the fact is, no one has advanced further in their ability to integrate multi-vendor PC LANs into business environments.

First, ComputerLand has already designed and installed more than twice as many single and multi-vendor networks as our nearest competitor. (That represents over 700,000 nodes.) For clients that include hundreds of Fortune 1000 companies. In businesses ranging from oil exploration to electronics. From travel to telephones.

But installing networks is just part of the picture. We train your staff to use network management tools—or we can manage networks for you. We offer ongoing support and service. In fact, ComputerLand is the largest, most experienced Apple® and Compaq® service source. As well as the largest IBM® PC service provider next to IBM itself.

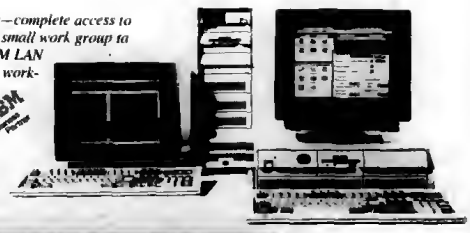
Or would you rather work

We've spent a lot of our time, energy and money on assembling the largest SE staff in the industry. Over 350 professionals, all with hundreds of hours of training. Plus certification by all the major manufacturers. And, most importantly, thousands of hours in the trenches tying heterogeneous networks together.

If you're interested in networking around the globe, no one is as perfectly positioned to help as ComputerLand, now with branches in 24 countries worldwide. From Santiago to Sydney. From Moscow to Milan. So, if you want to connect with overseas staff, subsidiaries or suppliers, our resources are already in place.

The IBM family of local area networks promises—and delivers—complete access to critical information systems. From a PC network used by a factory or small work group to a nationwide network of bridged high-speed Token Ring Networks, IBM LAN products put it all together. They allow you to link mainframes, minis, workstations and peripherals into a comprehensive business resource.

In fact, IBM has long set the standard in the development of communications architectures and implementation strategies. From the introduction of Systems Network Architecture (SNA) over a decade ago to today's Systems Application Architecture (SAA).



IBM PS/2 Model 95 XP 486, IBM PS/2 Model 90 XP 486

with someone who already is?

Importantly, we carry products from all the top players in networking: Novell, Microsoft, 3Com, Banyan, HP and, of course, IBM, Compaq and Apple. So you're not locked-in to one vendor.

And, as the oldest and largest PC resource anywhere, we enjoy solid, long-standing relationships with all these manufacturers. That means ComputerLand is often the first to make new technology available. We can get vendor information to help solve your problems faster than anyone else. And we're able to maintain the largest, most complete product inventory. Period.

HOW PC LANS GIVE COMPUTERLAND THE DISTRIBUTION SYSTEM OF THE FUTURE TODAY.

When it came to networking the fastest, most effective distribution system in our industry, we couldn't blow it. After all, if we couldn't do it for ourselves, what credibility would we have when we did ... it for you?

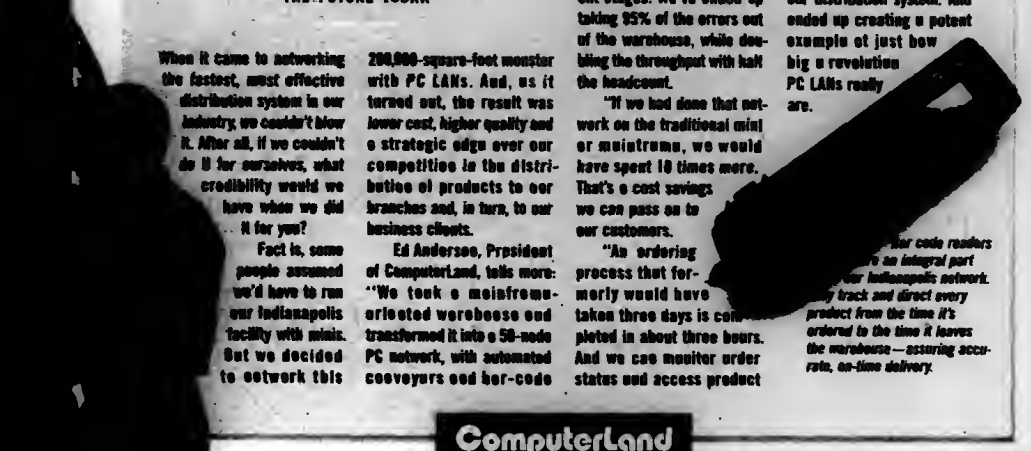
Fact is, some people assumed we'd have to run our Indianapolis facility with minis. But we decided to network this 200,000-square-foot monster with PC LANs. And, as it turned out, the result was lower cost, higher quality and a strategic edge over our competition in the distribution of products to our branches and, in turn, to our business clients.

Ed Andersen, President of ComputerLand, tells more: "We took a mainframe-oriented warehouse and transformed it into a 50-node PC network, with automated conveyors and bar-code technology. There's a quality audit at each of 4 or 5 different stages. We've ended up taking 95% of the errors out of the warehouse, while doubling the throughput with half the headcount.

"If we had done that network on the traditional mini or mainframe, we would have spent 10 times more. That's a cost savings we can pass on to our customers.

"An ordering process that formerly would have taken three days is completed in about three hours. And we can monitor order status and access product availability data directly."

We set out to improve our distribution system. And ended up creating a potent example of just how big a revolution PC LANs really are.



...ar code readers ...e an integral part ...ur Indianapolis network. ...y track and direct every product from the time it's ordered to the time it leaves the warehouse—assuring accurate, on-time delivery.

ComputerLand

Building a network without

EVEN IF you're already convinced that PC networking is the greatest thing since the invention of the microchip, chances are you have some very valid concerns about implementation. Compatibility is probably one of the first.

At ComputerLand, we've learned which hardware and software best support multi-vendor connectivity requirements. Especially when you want to link Apple computers, COMPAQ DESKPRO's and IBM PS/2's—an assignment we successfully complete virtually every day.

You're also likely to be connecting PCs to minis or mainframes, which sometimes results in slow data response time. We can recommend technology to work out the kinks. In fact, we recently helped a large law firm with this very problem by adding a Macintosh® file server to a network connecting two DEC VAX™ 3100s with dozens of Macs and several PCs.

If security is an issue—and it usually is—we can help with software that controls user access at the appropriate level. From file servers down

In the old days (about 5 years ago), linking MS-DOS, MacOS and UNIX® operating systems was a lot like mixing apples and oranges. Today, thanks to the maturity and stability of PC LANs, ComputerLand can provide elegant, reliable and low-cost solutions to interoperability problems.

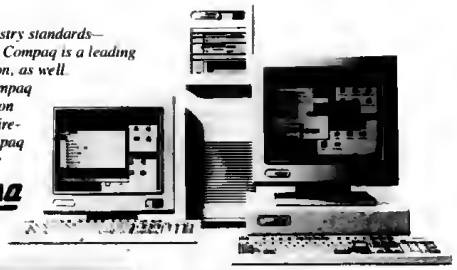
Cabling may not be your first concern, but it's critical to the functioning of your network. At ComputerLand, we've connected PCs two feet apart and twenty floors apart. In newly constructed offices and buildings a century old. And we've worked with everything from twisted pair to fiber optics.

COMPAQ products have always been built around open industry standards—designed to work powerfully in multi-vendor environments. Today, Compaq is a leading supplier of PC network servers and a leader in technical innovation, as well.

To maximize compatibility and performance, hundreds of Compaq staffers work closely with official hardware and software Integration Partners, keeping up with product developments and support requirements. What's more, LAN configurations are simulated in the Compaq Systems Integration Lab to assure that COMPAQ products operate smoothly with those from other vendors.

So, whether you have a LAN or enterprise-wide network, whether you use Novell, Microsoft, SCO UNIX or Banyan software, COMPAQ PCs fit right in.

COMPAQ

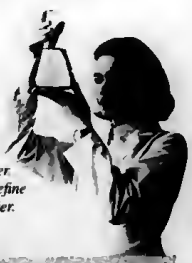


COMPAQ SYSTEMPRO.
COMPAQ DESKPRO 386N

re-inventing the wheel.

to individual files. And since PCs now have sophisticated archival capabilities, data preservation can be ensured.

When the state-of-the-art Illinois Hazardous Waste Research and Information Center opened its doors, management turned to ComputerLand for state-of-the-art networking. Two interconnected Novell LANs were designed and installed. One to capture and share data from scientific instruments. The other to handle proposals, letters and other front office functions. Each using a COMPAQ SYSTEMPRO® as a file server. Now the agency is working effectively to map dump sites and define research funding priorities. And we can all breathe a little easier.



COMPUTERLAND CREATES A NEW PC LAN IMAGE FOR O.D.S. HEALTH PLAN.

electronically manipulate the [illegible]—and that runs on a mini. [illegible], to get integrated information to each claim representative's desk, a PC was the only answer.

"ComputerLand was not the lowest bidder—but it was obvious they had an incredible investment in technology and sales support. During a visit to the ComputerLand Technology Center in Portland, we met their systems engineers and service people, toured their local distribution center—including parts and inventory—and discovered a first-rate operation all the way.

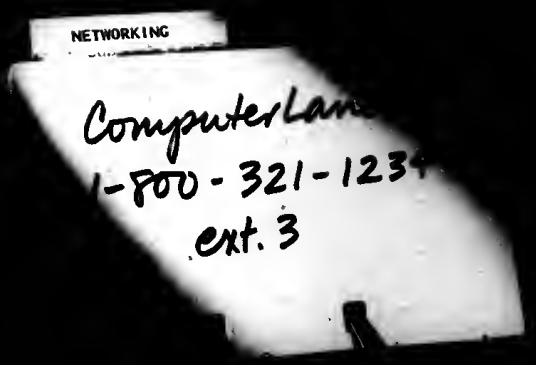
"The technology center perfectly replicated the environment we wanted. The systems engineer who designed that system is managing the project for us. What more could you ask for?"

Kevin Egan, ComputerLand's Marketing Manager in Portland says, "Our 5 full-time systems engineers—with over 35 years of data management/processing experience—have worked in many environments like the one at O.D.S."

Says Hackett, "They designed our network along with the OEM, and supplied technical expertise on connectivity. The power of the system comes from the fact that on every desk is a PC that has access to all resources on the network.

"ComputerLand is also configuring the PCs before they come to us—about 80 of them—and doing it all, right down to unboxing and placing one on each desk.

"When it comes to PC LANs, I would highly recommend ComputerLand to anyone."



MAKING THE right network connections couldn't be easier. Just call us and we'll arrange for a ComputerLand network consultant to contact you. But if you can't discuss your networking plans now, call anyway and we'll send you a free (and insightful) audio cassette, *ComputerLand Report On PC Networks.*

If you're responsible for setting your company's computing strategy, you may also be interested in our networking seminar series, "PC Networks: Coming of Age."

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Microsoft defends pen computer record

BY PATRICIA KEEFE
CW STAFF

Those who view Microsoft Corp. as akin to the "Evil Empire" are most vociferous when charging that Pen Windows is nothing but a vaporous preemptive strike aimed at nipping Go Corp.'s Penpoint operating system in the proverbial bud.

Of all the accusations hurled at Microsoft over the last few weeks, nothing raises its hackles more. Jeff Raikes, Microsoft's vice president of office systems, positively seethes at the suggestion. "We're damned if we do and damned if we don't."

Raikes: *'We're damned if we do and damned if we don't'*

In fact, he maintains, Microsoft has dabbled in pen-based computing off and on over the last decade, intensifying its efforts during the last 18 months. "People have the impression that Go announced something, and then we scrambled around and started to do some work," Raikes complained.

Microsoft Chairman Bill Gates is said to have first worked with Epson America, Inc. on a stylus-based machine in 1981. But, Raikes said, the technology was premature. Then three or four years ago, Gates had some discussions with Infa Corp., a pen-based start-up at the time.

Later, at Go's request, Microsoft and Go talked about working together. Go wanted Microsoft to develop applications for its then-planned shareware, Raikes said. (Go has since backed away from hardware.)

In the end, Go turned down Microsoft's suggestion that it build pen-based computing on top of Windows. Microsoft, in turn, rejected Go's suggestion that it relicense Penpoint.

"We made the right decision not to pursue that. At the time, we were being criticized for having too many operating systems, and we didn't think we should pick up on another one," Raikes explained.

The two firms went partially separate ways. Microsoft gave Go its Rich Text Format specifications, while Go has proposed that the two cooperate on an "inking" format or the way input is visually represented on the screen. "I think that is a good idea," Raikes said, adding he would like to see the two cooperate in other areas as well. He admitted it is "not likely" that "gesture" standards will be one of them.

Today, despite assertions to the contrary by detractors, work on Pen Windows is well under way, he said. "It is not vapor." Over 200 developers kits were distributed at a conference in February sponsored by Microsoft, and 21 OEMs have announced support plans.

Raikes said he expects to deliver software to hardware vendors by year's end, adding that a number of them plan to ship machines in early 1992.

"I did a demo at the Esther Dyson conference and got a positive response. Even [Go President] Jerry Kaplan said we were very far along," Raikes said.

He also dismissed some complaints that Windows is a less than ideal platform for a pen-based system. Microsoft's pen-based computing efforts fall into three areas:

- Pen-based extensions to the operating environment. This will include power management (to enhance battery life); ergonomic issues, such as how the menus drop down based on whether the user is left- or right-handed; and pen drivers to support the pen.

> "PEOPLE HAVE the impression that Go announced something, and then we scrambled around and started to do some work."
>
> JEFF RAIKES
> MICROSOFT

- Work on text recognition technology, particularly in the areas of cursive script, delayed strokes and stroke-order independence. Go and Microsoft are proposing different "gesture" standards. Microsoft is backing an open application programming interface for plug-in recognition technology along with several other vendors. These include Wang Laboratories, Inc., Grid Systems Corp., CIC Corp., Momenta and Paragraph, a Moscow-based, partially U.S.-owned venture.
- Pen-enhanced applications. The main one, he said, is a notebook package that "relies heavily" on Microsoft's Object Linking and Embedding specification to allow objects from various applications to be embedded into the notebook. It will be bundled with Pen Windows.

Over the next 12 months, Microsoft will concentrate on completing work it is doing in outlining, increasing developer and OEM support to build a family of applications and working to get the cost of the technology down.

Bank takes its philosophy to heart

PCs join integrity, service and teamwork in contributing to bottom line

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

LANSING, Mich. — Michigan National Corp., one of the state's largest banks, counts on its philosophy to make the numbers add up right. Phrases such as integrity, world-class service, team and meritocracy appear in its one-page treatise entitled "The Michigan National Philosophy."

A metaphysical approach to banking has not hurt the bottom line — $11 billion Michigan National posted profits of $48 million in last year's tough climate.

The bank's operating paradigm also attracted Charles Kight, Michigan National's executive vice president of consumer banking and information technology, and has spurred information systems toward personal computer use to improve service by dropping cycle time through better communications.

Michigan National's Kight *focuses on reducing cycle time using PCs*

Reducing cycle time — the time it takes to accomplish something, be it resolving a customer problem or answering an employee question — is Kight's focus and one reason Michigan National is installing PCs.

"We're very committed to our values, and we've had a major program under way in terms of getting our customers the

Continued on page 38

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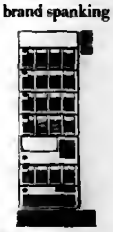
	Hardware Price	MFLOPS	SPECmarks*
POWERstation 320H	$17,972	11.7	32.4
SPARCstation 2	$14,995	4.2	21.0
DECstation 5000	$19,395	3.7	18.5

My How We're Growing.

And even more amazing, these babies just keep getting bigger. Now, we're introducing the new RISC System/6000 POWERstation 320H. It runs 11.7 MFLOPS* and 32.4 SPECmarks? If you already have the original POWERstation 320, you can upgrade it now to the even more spectacular performance of the 320H.

Yet Another New Addition To The Family.

Our POWERserver 950 is also brand spanking new. It gives you the performance of the POWERserver 550—25.2 MFLOPS and a SPECmark of 56.3—but in a rack-mounted system, to share more disk storage, power and expandability with others. And all the models in the UNIX*-based RISC System/6000 family can now add disk expansion units for up to quadruple their previous maximum fixed disk storage. This yields up to 22.2GB on the POWERserver 950.



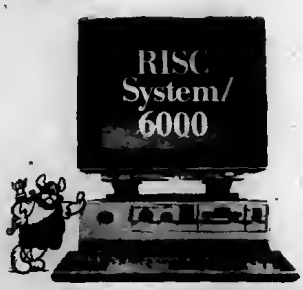
A New Box Of Crayons.

Then there's the POWERgraphics GTO graphics subsystem. It can attach to any model in the RISC System/6000 family, to deliver super graphics performance previously available only in the POWERstation 730—990,000 3D vectors/second and 120,000 shaded polygons/second. That's more than enough to make your graphics look like a masterpiece.

Memory At Prices That Won't Cause Tantrums.

And now you can get more memory for less. The more memory you buy, and the bigger the increments, the less you pay per MB. After all, just because we're a year old doesn't mean we don't know the value of money. Especially yours.

To find out more about the RISC System/6000 family, call 1 800 IBM-6676, ext. 878. And if you think this one-year-old is a handful now, just wait until the terrible twos.



For the Power Seeker.

IBM

*SPECmark is a geometric mean of the ten SPECmark tests. MFLOPS and LINPACK double precision where n=100. AIX XL FORTRAN Version 2.1 and AIX XL C Version 1.1 compilers were used for these tests.

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Computer-aided design frees engineers' creativity

ON SITE

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Design engineering used to mean pencils and drafting tables, which were user-friendly and cheap. With computer-aided design (CAD), capital expenditures expanded exponentially, and even the hottest design houses, such as David Kelley Design, cannot support a workstation for every engineer.

Despite its success in designing Apple Computer, Inc.'s mouse, Metaphor Computer Systems, Inc.'s infrared mouse and Next, Inc.'s workstation shell, the firm still jockeys its engineers around its workstations in a game of musical chairs.

"In the Boston office, one engineer gets in about 4 a.m. and works until afternoon; then the second engineer comes in and works into the night," said Tom Kelley, director of marketing.

In the main office here, there are 18 workstations for 30 engineers. Although everyone has an Apple Macintosh, there are "some fights" over access to the CAD workstations, according to Dennis Boyle, senior engineer. "Everyone craves the speed," he added.

"It's not that costs are insurmountable, but it is possible to lose money," Kelley said. He estimated that the firm has invested $1 million in hardware and software in the last five years.

David Kelley Design *works such as the Jaminator guitar come from engineers who are free to create but compete for CPU time*

The company uses Hewlett-Packard Co.'s ME 10 (two-dimensional) and ME 30 (three-dimensional) CAD software on a range of HP's Apollo division workstations from Series 319s at the low end to Series 425Ss at the high end.

In a nondescript building, David Kelley Design engineers create functional, easy-to-manufacture products. On the inside, high-tech furniture, white-board walls and a fleet of balloon-tired bicycles for fun encourage engineers to explore their creativity, fashioning parts in the floating, light and shadowed space of design software.

Using CAD, designers said, greatly reduces time to market. For instance, an electric toy guitar, called the Jaminator, only took them from October to January 1990 to complete. Ordinarily, it takes between nine months and two years to get a product out, said Paul Barsley, chief operating officer at David Kelley Design.

"We work with industrial designers who know the limits of reality. We, in turn, know the limits of art," Boyle said.

For instance, Steve Jobs, Next's chief executive officer, wanted his company's sleek black monitor to "float in space," Kelley said. "They came up with a vision, and we detailed how to make thousands of them."

Manufacturing is made faster and more elegant with careful design. For instance, the company can figure out how to manufacture a part without turning it around on an assembly line, Barsley said.

Designers on leading edge

Suppliers and manufacturers have yet to catch up with designers in terms of technology. Only a few suppliers have the ability to take computer data and turn it into parts without traditional blueprints. "The technology does restrict choice," Kelley said.

When the company finds suppliers with the technical capability, "we send a tape to suppliers that describes parts. They do the necessary manufacturing and send the parts to us," Barsley said.

Although manufacturers and suppliers have yet to automate to David Kelley Design's level, their use of CAD still greatly speeds the time to market, and "time to market is everything," Kelley said. "With CAD databases, documents can go straight to tooling, but still, most customers insist on mechanical drawings because we're not a paperless society."

One day, manufacturers will just look at a database. But according to Barsley, "we're not there yet."

Laptop BIOS enters market

BY MICHAEL FITZGERALD
CW STAFF

As portable computers proliferate, BIOS vendors push into new fields by writing BIOSs especially for laptops.

Phoenix Technologies Ltd. recently followed last year's announcement of a BIOS specialized for laptops with Intel Corp.'s 80386SL chip set by revealing that it had 10 OEMs working with the BIOS.

Meanwhile, Phoenix got competition in the laptop BIOS marketplace from Award Software, Inc., another major BIOS maker. Award and Phoenix market their sets largely to Far Eastern makers of clone and compatible personal computers. The products are the major reason why clone portables are suddenly hitting a market that for years has had offerings from only a few firms.

"These kinds of products will make it that much easier for small vendors to enter this market," said Peter Teige, an analyst at Gartner Group/Infocorp.

Award's BIOS offers specialized power management functions to increase battery life. In addition, it features a suspend/resume function that allows users to turn off their machines in the middle of an application and come back to that point without rebooting.

Mips fills out low-end processor line

BY CAROL HILDEBRAND
CW STAFF

SUNNYVALE, Calif. — News of a workstation and two servers announced last week by Mips Computer Systems, Inc. solicited lukewarm enthusiasm from the analysts, with most seeing it as business as usual.

"It gives them a good product line, but I can't get too enthusiastic about it because three months from now, somebody else will do something else in the workstation area. It's just more of the same," said Sandy Gant, an analyst at Gartner Group/Infocorp in Santa Clara, Calif.

The workstation and servers, based on Mips' 33-MHz R3000A microprocessor, represent a bolstering of the firm's low-end family, said Michael Cohen, Mips' product marketing manager of entry systems.

In January, the company had announced 33-MHz models in the midrange and at the high end of its product lines.

Gant said it was a prudent move. "Mips is staying aggressive in its product life cycle," she said. "They're staying on the curve, doing what they need to do."

The workstation, the Magnum 3000/33, is rated at 25.1 Specmarks, the firm said. Memory capacity ranges from 8M to 128M bytes with disk space up to 6G bytes. The original Magnum 3000 was renamed as the 3000/25, and its price was cut by $1,000, to $7,990.

Geared for small groups

Mips said it has slated the RC3330 as an entry-level server for small work groups. The box delivers 25.1 Specmarks of performance and is configured with the same memory and disk capacity as the workstation. Cohen said its predecessor, the 25-MHz RC3230, will be reduced in price from $9,740 to $8,990.

The second server, the RC3350, is positioned for larger work groups with higher end needs. The RC3350 is rated at 26.5 Specmarks, the company said, and a base configuration includes 16M bytes of memory, 328M bytes of disk storage and 150M bytes of storage on ¼-in. cartridge tapes, with VME expansion capabilities extending the server's capacity.

The desktop workstation and server are also available as upgrade boards, the firm said.

Pricing starts at $10,990 for the Magnum 3000/33, $11,990 for the RC3330 and $36,500 for the RC3350.

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Bank

FROM PAGE 35

quality they deserve," Kight said. The bank is installing IBM Personal System/2 Model 55SX PCs in its administrative offices and its branches to give key employees, such as managers and loan officers, easier access to mainframe databases.

For example, if a customer's query needs to be transferred to another employee, a screen full of information about that customer can be transferred right along with the call via IBM's Rolm Systems Callpathing, which hooks the telephone switch to the mainframe. Being able to perform such seamless transfers saves the second employee time and gets questions answered more quickly.

"We [in IS] don't measure our success on how many databases we go through . . . what I care about is how easy it is for the customer to get it done," Kight said.

The bank even wants to make sure customers can establish a long-term relationship with individual tellers and officers and is using its computers to track turnover trends — where turnover happens and the reasons behind it — so it can keep people in place longer.

The bank installed Allegro, an electronic mail interface it co-developed with Motart Systems Corp. about 1½ years ago. Kight credits Allegro, a colorful, mouse-oriented graphical interface that runs in IBM's MVS/Officevision over IBM's Distributed Office Support System, with giving users much easier access to mainframe databases and greatly reducing cycle time on internal communications. Users include top management in Farmington Hills, Mich., and Kight and another senior vice president in Lansing, most of the administration and several layers of managers. The system is being implemented in all 188 bank branches and is on target for a third quarter completion.

"We're trying to make it easier for team members to talk and get answers. We want to get down the cycle time so people answer your questions in a hurry," Kight said.

Easier access

Kight said Allegro's ease of use has changed the way people work. Because it greatly simplifies access to the mainframe, users don't shy away from the system the way they did before. The system also keeps a log of what information people want and how they ask the system for it so the systems group can update the selection of commands available to the mouse.

One step toward reducing cycle time came six months ago, when Michigan National started using multimedia applications on PCs. The company makes its own customer presentations, training videos and internal communiques using a Sony Corp. Mavica MVC Model 2000 with a 2-in. floppy disk and running under OS/2 on an IBM PS/2 Model 80. Images are transferred from the camera to the PS/2's 80Mbyte hard disk via a Sony still-video disk digitizer.

The presentation is edited on the PC, transmitted back to videotape and taken on-site or to a branch for playback on a VCR and television.

The video system eliminates the need to contract for entirely new videos when changes are necessary. "We never did that because you couldn't begin to have cost-effective video," Kight said.

The company had used videos for some purposes, but now it costs them less than $2,000 for a full-motion training video. "This is the first time we've ever communicated from every business unit," he said.

Michigan National has been bringing in PCs and automating branches for business purposes, Kight said. Technology purchases always have a business reason behind them. Kight said Michigan National is not after the latest and greatest but just what works best for it.

"We went out and got a business need and then found the technology to drive it, as opposed to the other way around," he said. "For instance, we're going to electronic bill-paying for our customers. We'll make money because we get a fee for it, but the real reason is to give our customers more convenience."

"The technology is off the shelf . . . ," Kight said. "And E-mail probably pays for itself just in the paper we save, let alone the reduction in cycle time."

MICRO NOTES

Lotus resets upgrade path

Lotus Development Corp. has extended its $49 Technology Guarantee Program to include all new or upgrade purchases of its personal computer-based 1-2-3, Symphony, Freelance Graphics and Ami Pro. The program protects users' investments by allowing them to upgrade for $49 if a new version of an application ships within six months of the date of purchase. It also replaces the previous upgrade policy, which varied by category and specific product release.

Deneb Systems, Inc., in conjunction with IBM, has produced a storyboard and videotape featuring the IBM RISC System/6000 family and Deneb's Construction Accounting and Estimating System software.

Microsoft Corp.'s Word for Windows Version 1.1a is now shipping. Registered users of Word for Windows 1.0 or 1.1 can upgrade to this version for $10. Separately, Microsoft announced an exclusive licensing agreement for its Multimedia Publishing Group to market and distribute a number of multimedia titles from The Voyager Co.

A TOAST TO THE SWEDISH S

COMMENTARY

Christine Comaford

Advice for GUI projects

Microsoft's Windows 3.0 has clearly caught the market'a attention, and the pressure to move to the new environment is strong. The lure of application interface consistency, simplified access to corporate data via graphical user interface (GUI) front ends and easing users' dependence on support is powerful.

Although the siren song is sweet, developers are feeling justifiable anxiety over their ability to move to Windows.

The following are elements our firm has found to be critical for Windows development.

Some applications may be prohibitively expensive or simply unreasonable to move to Windows. For example, if your product is a graphics- and CPU-intensive molecular modeling tool, it might not make sense to port it to Windows. The performance of complex graphics rendering under Windows 3.0 is generally considered unacceptable.

It seems obvious, but sometimes developers don't pay enough attention to the status of the customer'a technology investment. If the application requires users to make a major hardware upgrade (such as adding more memory or a math coprocessor), you need to consider what percentage of the user population is likely to find a GUI implementation worth the cost.

Also, corporate developers are often asked to cost-justify the development in hard dollars, an admittedly difficult task. While GUIs are expected to cut training costs in the long run, there is the initial educational investment. But training can be leveraged over many tasks, and related productivity increases should result from similarities between many different Windows applications.

It can also be argued that the investment in Windows is an investment in a technical infrastructure; there may not be quantifiable payback from Windows but rather from the new areas of work that Windows enables.

Experiment with various computer-aided software engineering and prototyping tools under Windows. The right tools can dramatically cut development time. Always look at tool decisions from both a technical and a business standpoint. If the vendor isn't stable, you could end up with an unsupported environment.

Windows development does not happen overnight — both commercial and corporate developers need to plan. The complexity of a port from another platform depends on what language the application is written in, how structured the existing code is and what tools in addition to the Windows Software Developers Kit (if any) will be used. A port can take six to 18 months. New development takes longer.

It is crucial that someone with intimate knowledge of the complicated Windows environment reviews the project'a source code and creates a project plan before any coding begins. The plan, which should include development milestones, delivery dates and costs, will often take two to eight weeks to produce.

Inexperienced Windows programmers may be able to help with implementation, but programmers with three to five years of Windows programming experience are critical. Windows programming is complex, and its semiobject-oriented, event-driven structure requires a somewhat different mind-set from traditional programming.

Common User Access (CUA), IBM'a Systems Application Architecture-based standard for application "look and feel," is limited in its current incarnation. You'll need to make interface choices beyond today's CUA specification. For example, some interface components such as tool bars, status bars, "ribbon" and caches of recently opened files are becoming de facto standards.

When developing a product capable of supporting multiple platforms, there are several issues to consider. If, for example, you want to support both Windows 3.0 and Apple's Macintosh, you need to decide whether it is more important to have the product look the same on both machines or whether it is better to capitalize on the unique capabilities of each platform.

If you're moving from DOS to Windows, decide how you will negotiate the trade-offs between making a Windows 3.0 product consistent with existing Windows applications vs. making it look and feel like your current DOS product.

Are you more concerned with making your old users comfortable or with attracting the new Windows fans? Should file formats across platforms be instantly compatible or would an import/export utility suffice?

Each choice you make results in altering the development schedule and costs.

If you do decide to support multiple platforms, consider whether to base your multiplatform product line on a foundation of common code or whether it makes sense to maintain two unique products.

It may initially take longer to develop common-code technology, but an investment in a sophisticated design may pay big dividends in decreased maintenance, enhancement and support costs later.

Be realistic about schedule slippages. If you've scheduled four days for each of 10 tasks and task No. 1 slips one day, the total schedule will probably slip not one day but 10 — you've probably underestimated all the tasks.

Comaford is a partner at consulting firm Kuvera Associates, Inc., which has offices in Redmond, Wash., and Sausalito, Calif.

AFETY STANDARD.

IDEA

The intelligence to communicate better

Users test front-end tool

BY MAURA J. HARRINGTON
CW STAFF

EL SEGUNDO, Calif. — Information systems managers concur that it is tough to find experienced software developers who are familiar with the ins and outs of object-oriented programming languages.

So when Inference Corp. introduced its first windows-driven, front-end software application development tool for its 3-year-old proprietary database management system last month, customers expressed immediate interest.

The product, called Case Based Reasoning (CBR) Express, is a front-end tool for applications development designed for Inference's Automated Reasoning Tool for Information Management (ART-IM), a proprietary knowledge-based information management system based on object-oriented programming technology.

In addition to running under Microsoft Corp.'s Windows 3.0 for an easy-to-use graphical user interface, CBR Express features the ability for novice users to add to the ART-IM proprietary CBR-style database without any knowledge of the object-oriented language, according to Inference Chief Executive Officer Peter Tierney.

For example, Lynden Tennison, manager of the Knowledge Systems Division at American Airlines, uses ART-IM to develop applications ranging from sales support information management systems to end-user Help service systems. American Airlines has been an Inference customer for three years.

"We're getting ready to bring in CBR Express for our internally developed applications, including our help desk, maintenance and marketing systems," Tennison said, citing CBR Express' ease of use. He added that the new product will probably run on Intel Corp. 80386 and 1486-based personal computers, running Windows 3.0 under DOS and eventually OS/2 platforms.

At Intervoice, Inc., an automated voice systems firm in Dallas, CBR Express is expected to be used in conjunction with an ART-IM help desk system to make it easier for technical analysts to field questions from customers, according to Walter Elkins, field service manager at the Real Care Help Systems Department there.

"We have about 1,700 customized voice systems worldwide ... and that means my help desk people have to deal with a lot of diversity when people ask questions," Elkins said.

Current ART-IM users can buy CBR Express for $4,000. For new Inference customers, CBR Express will be packaged with ART-IM for $40,000. Network versions start at $40,000 for 10 users, Tierney said, adding that at least 4M bytes of memory are suggested for running CBR Express on a PC.

Study ranks Mac first in class

BY JAMES DALY
CW STAFF

How does Apple Computer, Inc.'s Macintosh stack up against personal computers running Microsoft Corp.'s Windows 3.0? The Macintosh wins hands down, according to a report recently prepared for Apple by an independent testing laboratory.

The benchmark study conducted by the Ingram Laboratories found that the Macintosh offered swifter applications performance than similarly configured IBM and Compaq Computer Corp. PCs as well as a better price/performance value. "The Macintosh computer's unified architecture — with the hardware and operating system designed together from the chips up — performs better than a computer whose graphical interface is added to an existing operating system," the report stated.

Researchers in the Apple-commissioned study compared the time it took applications running on the Macintosh to complete a series of functions with an identical applications function suite running on comparable Intel Corp. 80286-, 80386- and 1486-based systems using Windows 3.0. Among the packages were Aldus Corp.'s Pagemaker, Informix Software, Inc.'s Wingz and Microsoft's Excel, Microsoft Word and Powerpoint.

The results showed that the Macintosh line, from the entry-level Classic to the high-end Macintosh IIFX, consistently outperformed its PC competitors — often by as much as 70%. For example, an information systems management application on the Macintosh Classic took just over three minutes.

The Macintosh scored its biggest leads in graphics and publishing applications, while its narrowest victories — and occasional defeats — occurred in productivity applications such as Wingz, Microsoft Word and Excel.

Apple advantage
Apple says its Macintosh beat Compaq and IBM PCs in benchmark tests

Performance on application mix

System	Total time (in minutes)
Apple Macintosh IIFX	7.15
Apple Macintosh IICI with cache card	9.22
Compaq Desktop 486/25	9.70
Apple Macintosh IICI	9.76
Compaq Deskpro 386/33	11.40
Apple Macintosh IISI with math coprocessor	11.61
IBM PS/2 Model 70 486	11.97
Apple Macintosh IISI	13.36
Compaq Desktop 386/25E	15.25
IBM PS/2 Model 70 386/25	15.40
Apple Macintosh SE/30	17.35
Apple Macintosh LC	17.61

Source: Apple Computer, Inc

CW Chart: Marie Haines

NEW PRODUCTS

Systems

Epson America, Inc. has announced a computer equipped with a 20-MHz Intel Corp. 80386SX processor and 2M bytes of random-access memory.

The Equity 386SX/20 Plus features zero wait-state performance and a 32K-byte memory cache running at 25 nsec.

The company claims that the system is among the first to support Edsun Laboratories, Inc.'s Continuous Edge Graphics, a digital-to-analog converter that reportedly blends colors between abutting pixels to eliminate jagged edges that usually appear on a monitor's display.

A 3½-in. floppy drive-based version costs $2,299; a version configured with a 100M-byte hard drive and a single floppy drive lists at $3,449.

Epson America
20770 Madrona Ave.
Torrance, Calif. 90509
(213) 782-5161

Software applications packages

Macola, Inc. has announced an enhanced version of its modular, personal computer-based accounting software package.

Version 5.0 of Macola Accounting Software features a user interface equipped with menu bars, pull-down menus and pop-up windows. Other features include password protection for all the product's applications and full-screen editing facilities that allow users to move up or down entry fields.

The product includes five accounting modules, four distribution modules and eight manufacturing modules. Pricing ranges between $795 and $1,595 per module.

Macola
333 E. Center St.
Marion, Ohio 43301
(614) 382-5999

Cognos, Inc. has announced an enhanced version of Powerplay, a reporting and analysis tool designed for Microsoft Corp. Windows 3.0 and Hewlett-Packard Co. New Wave environments.

Powerplay 2.0 ($850) can display data from any database in graphical forms, such as pie charts or bar graphs. Users are reportedly able to access, manipulate and visualize business data via a series of graphical, mouse-driven steps.

Other features include a reporting utility that allows users to sort data by rows or columns, correlation graphs that can be superimposed on top of other graphs and a display definition window that explains how computations were calculated in each cell.

Cognos
67 S. Bedford St.
Burlington, Mass. 01803
(617) 229-6600

Storage

Peripheral Land, Inc. has announced Infiniti 88 Turbo, a removable cartridge drive designed to accommodate 88M-byte cartridges.

The product features 85.3M bytes of formatted storage capacity, an average access time of 20 msec and support for ANSI's SCSI-1 and SCSI-2 small computer systems interface (SCSI) standards, according to the vendor.

A SCSI controller card is required. Infiniti 88 Turbo is priced at $1,799. Shipments began last week.

Peripheral Land
47421 Bayside Pkwy.
Fremont, Calif. 94538
(415) 657-2211

Interpreter Tape Back Systems, Inc. has announced a 160M-byte version of Tapexchange, a tape backup system designed for IBM Personal Computer XTs, ATs and compatibles.

Tapexchange Model 160TX ($1,595) attaches directly to a PC's standard parallel printer port without requiring any controller cards. Features include individual drive, directory and file tagging; prompts for multiple tapes and appended sessions; and command line functions.

The company also unveiled Discxchange ($1,649), a portable, external hard drive that attaches to an IBM Personal Computer XT, AT or compatible.

The product incorporates Syquest Technology's SQ555 and 44M-byte SQ400 Winchester-based cartridges.

Interpreter
11455 W. 48th Ave.
Wheat Ridge, Colo. 80033
(303) 431-8991

Peripherals

Videologic, Inc. has begun shipping a portable computer graphics-to-video scan converter.

Mediator ($2,995) was designed to convert a personal computer or Apple Computer, Inc. Macintosh system display output signal into a composite or S-video signal.

The product can automatically determine whether an input source contains PC- or Macintosh-generated graphics and make appropriate adjustments.

The product can be used with nearly any PC or Macintosh display adapter or a digital video adapter.

Videologic
245 First St.
Cambridge, Mass. 02142
(617) 494-0530

Viewsonic, an affiliate of Keypoint Technology, Inc., has unveiled a noninterlaced, 14-in. ultra Video Graphics Array color monitor that features a 248mm by 186mm display area.

The Viewsonic 6 is a multisynchronous device that automatically adjusts to horizontal scanning frequencies ranging from 30 KHz to 50 KHz or vertical frequencies from 50 Hz to 90 Hz, according to the vendor.

The monitor can operate within an IBM Personal Computer XT, AT or compatible; Apple Computer, Inc. Macintosh II; or Sony Corp. C1304. The product is priced at $699.

Viewsonic
12130 Mora Drive
Santa Fe Springs, Calif. 90670
(213) 946-0711

Paradox 3.5: More than meets the eye

Borland International's Paradox Version 3.5

Reviewers	Ease of use	Data integrity	Multiuser support	Performance	Application development	Documentation	Service & support	Value	Score
Byte 10/90	Virtually unchanged	NC	Easy	Dramatic improvement	Allows fine-tuning	NC	NC	Good	One of the most intuitive
Infoworld 11/12/90	Very good	Very good	Good	Excellent	Good	Excellent	Poor	Excellent	7.2*
PC Week 12/10/90	Needs improvement	Satisfactory	Good	Satisfactory	Good	NC	NC	NC	Impressive performance
Users									
Kevin Smith, USA Today	■■	■■	■■	■■	■■	■■	■■	■■	Very good
Michael Irwin, Washington, D.C. Metro Police Department	■■	■■	■■	■■	■■	NC	■■	■■	Could improve syntax
Bruno Oldweiler, Bank of America	■■	■■	■■	■■	■■	■■	■■	■■	Easy to use
Analysts									
Dean Miller, D. L. Miller & Associates	■■	■■	■■	■■	■■	■■	■■	■■	Good
Jerry Caron, Faulkner Microcomputer Reports	■■	■■	■■	■■	■■	■	■■	■■	Good
David McGovern, Alternative Technologies, Inc.	■■	■	■■	■■	■■	■■	■	■■	Short on multi-user features

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey.
*Infoworld score based on 1 to 10 ratings where 10 is excellent NC: No comment

Key: ■■ Very good ■■ Good ■ Fair ■ Poor

Technology Analysis — a roundup of expert opinions about new products. Summary written by staff member Derek Slater.

On the surface, Version 3.5 of Borland International, Inc.'s Paradox relational database adds very little in the way of new user functions. The primary improvements are SQL Link, a separate software package that allows Paradox to act as a front end to SQL databases, and a speed boost from the addition of Borland's proprietary virtual real-time object-oriented memory manager (VROOMM). Those are very significant advances that help Paradox stack up well in the database competition, according to reviewers.

Ease of use: Though the Paradox user interface is fairly old, reviewers said it is extremely intuitive. The query-by-example feature, now mimicked by most competing products, simplifies data retrieval.

Data integrity: Protective functions in Paradox include passwords, encryption and automatic screen updating. Data entry by one user automatically locks others out of editing the same record (but not other records in the same table) in a multiuser environment. There are several other levels of table locking. However, *PC Week* found potential data integrity problems in the use of multitable forms.

Edits performed on an individual table instead of through the multitable form did not produce corresponding changes in linked tables.

Multiuser support: Paradox showed speedy performance in multiuser querying. Reviewers said the program's multiuser features are fairly basic, though. One flaw is that when a user selects to edit rather than coedit a table, other users cannot even view the same table.

Performance: Borland's VROOMM system breaks the program into very small code objects and swaps them to the cache or hard disk according to a least recently used algorithm. VROOMM also uses extended memory where available and gives Version 3.5 a big performance boost over the previous version of Paradox — up to 77% improvement in one casual sorting test, according to *Byte* magazine.

With the addition of VROOMM, Paradox is now based on the same core engine as Borland's Quattro Pro spreadsheet. Reviewers said interaction between the two programs is simplified.

Applications development: *Infoworld* said Paradox provides a "highly productive" environment for developers. The Paradox Application Language (PAL) simplifies development. Reviewers compared PAL to an extended macro in its ease of use and ability to automate many user-defined functions.

Documentation: In addition to the standard user's guide, Paradox includes separate manuals covering data presentation formats and PAL.

Reviewers reported that annoying spelling errors and factual mistakes found in the documentation of Version 3.0 have been corrected for the new release. Within the program, users have access to context-sensitive, online Help screens.

Service and support: Infoworld described Borland's telephone support for Paradox Version 3.5 as "uncharacteristically lacking." Users also verified that calling with technical questions often involves a long wait.

Value: Version 3.5 is priced at $795, which is standard for databases. There is also a competitive upgrade price of $175 available to users of other databases. Upgrading from Version 3.0 costs $135 — high for a product with so few added functionalities and features, according to reviewers. However, the SQL front-end capability is a significant advance. With its combination of speed, ease of use and practical features, Paradox impressed reviewers as an excellent value.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance	Average*
Peter Rogers, Robertson, Stephens & Co.	■■	■■	■■
W. Christopher Mortenson, Alex. Brown & Sons, Inc.	■■	■■	■■

*Rounded. Borland's net revenue for 1990 was $133 million, compared with $90.5 million in 1989. Net income was $11.8 million in 1990 compared with a $2.8 million loss for 1989.

"IT HAS BEEN difficult to get technical support on the line. It's usually a minimum of a 20-minute wait. But once you get them, they're very competent and friendly."

Kevin Smith
Business Systems Analyst
USA Today

Borland responds

Comments from Ken Hertaler-Walters, senior product marketing manager:

Service and support: One of the main reasons we had support problems is that a whole lot of Version 3.5 hit the market all at the same time. We have new telephone menu systems to automatically fax information to the customer and a completely new system to improve communications before the customer reaches a live support person. Lastly, we are planning some personnel increases. But we feel our real gains will be found by increasing support in the channel. We are initiating new training programs and developer support programs that will be announced in the near future.

Value: Reviewers tend to look at menu commands as the basis to judge a version change. What we did change, and what the user will notice, is performance, both in the engine and in memory handling. The user will also notice significant changes in form and report design options. Paradox will also be developed for the Windows environment, and it will not simply be a port.

NEXT WEEK

▶ Fox Software, Inc.'s Foxpro Version 1.02 offers an easy-to-use windowing interface and solid performance, according to reviewers.

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Mellon Bank revives ISDN plan

BY ELISABETH HORWITT
CW STAFF

PITTSBURGH — Recent encouraging developments in the Integrated Services Digital Network market have brought back into the fold at least one ISDN apostate: Mellon Bank Corp.

Mellon got interested early in the switched digital standard, participating in an ISDN trial put on by Bell Atlantic Corp. approximately two years ago. "Mellon Bank is for us a lead user, an innovator and early adapter of technology," said Larry Plumb, a Bell Atlantic spokesman.

Mellon Bank's Graham *now feels confidence in ISDN*

That made it even more of a comedown for Bell Atlantic when Mellon officially put its plans for a corporatewide ISDN network on hold six months ago.

"I was a very strong advocate of ISDN for a couple of years," said Patricia Graham, the bank's vice president of voice and data networking. "We had identified in the pilot several competitive-edge things and cost-beneficial things we could do with ISDN; we know what we want to do with it from an application standpoint. But we were just spinning our wheels."

Plan put on hold

Mellon decided to back off ISDN, at least for the moment, because it got tired of waiting for the technology to take off, Graham indicated.

"It got too frustrating" to keep hearing that viable vendor offerings would appear "any day now, and then nothing happens," she said.

In particular, Mellon grew frustrated with Bell Atlantic's inability or unwillingness to talk ISDN turkey. The local carrier, which currently offers ISDN lines on a per-customer, nontariffed basis, would give Mellon no specifics on the costs of an ISDN installation, Graham said. Furthermore, Bell Atlantic said it would need six months after receipt of order to begin delivering ISDN lines, and substantial ISDN service would not be deliverable in Mellon's home state of Pennsylvania until 1997, she added. "And again, in terms of available equipment, facilities and vendor understanding of applications, a lot was lacking. I think [Bell Atlantic] is more advanced in the Baltimore and Washington, D.C., area but not in Pittsburgh."

Another factor in the bank's decision was a court battle still going on in Pennsylvania to rule automatic number identification services as unconstitutional and therefore illegal. While Mellon had additional competitive applications in mind for ISDN, the ability to use incoming caller identification as a way to call up host files would have had "immediate cost and service benefits," Graham said.

The developments that caused Mellon to come back to ISDN came in rapid succession. The most telling was a meeting Graham had with Bell Atlantic representatives late last month, during which the local carrier assured her that ISDN tariffs were coming later this year, she said.

Tariffs to come

Plumb said an ISDN Centrex service will be tariffed in late spring and an ISDN single-line service for non-Centrex customers by year's end. Both of those services will support the ISDN Basic Rate Interface that defines two 64K bit/sec. B channels and one 16K bit/sec. D channel.

Bell Atlantic also expects to file a tariff by year's end for an ISDN Primary Rate Interface service, which supports 23 ISDN B channels plus one D channel.

Bell Atlantic offered Graham slim hope of being able to install "thousands of ISDN lines" in Pittsburgh by the end of next year, Graham said. However, "they led me to feel it is possible to get a significant number" within that time frame, particularly since Mellon's initial installation will be limited to one Bell Atlantic central office, she added.

Graham is also "hoping that automatic number identification gets resolved in Pennsylvania this year, [even though] it is still prohibited and still in the courts."

At least one vendor has hinted at imminent ISDN equipment reductions, she added. "Based on all of this, I'd say we'll be into ISDN big time in 1992."

The networking group at Mellon, which is a $31.4 billion bank holding company, serves not only Mellon users but also smaller banks.

Europe yet to offer all U.S. telecom comforts

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

The looming 1992 merger of 12 countries into a common European Economic Community conveniently parallels the trend of U.S.-based companies to expand globally. However, companies may have to wait years for the array and flexibility of telecommunications services they have enjoyed in the U.S. since the 1984 divestiture of AT&T.

While the European Commission has issued clear-cut directives on standards for interoperability among the disparate networks of the now monolithic Postal Telephone and Telegraph (PTT) authorities, those mandates have no influence on intracountry telecommunications regulations. It also remains unclear what entity or entities will be in charge of coordinating intercountry communications and smoothing out the potential result of billing nightmares.

In terms of service, each PTT will need to adjust its offerings to respond to the dynamics of an open market — a situation that has user groups such as the International Telecommunications User Group (Intug) already lobbying for changes.

Global gusto

The need to break down monolithic telecommunications entities into an integrated worldwide communications infrastructure is boosting away-from-home carrier spending

Source: Strategic Planning Associates, Inc. CW Chart: Darren St. John

One point of contention is the prohibition of connecting private and public networks in all European countries except the UK. "This has been a pain in the butt forever," commented George McKendrick, executive director of Intug in London. "Users are all naturally critical of such restrictions that deny them the benefits they have had in the competitive environment in the U.S. and the UK. We're making headway, but the process is a

Continued on page 52

'Hippi' means speed for lab users

ON SITE

BY CAROL HILDEBRAND
CW STAFF

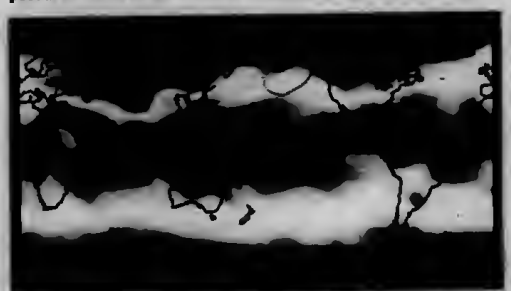
LOS ALAMOS, N.M. — As a federal research laboratory, Los Alamos National Laboratory attracts its share of eccentrics. Blue jeans and relaxed hairstyles are more the norm than the exception. So it seems fitting that the laboratory named its fledgling supercomputing channel standard "Hippi."

Hippi, or High-Performance Parallel Interface, is Los Alamos' answer to a chronic problem: answering the rarified needs of a handful of users who were running scientific problems with very high-speed requirements beyond the reach of commercial networking vendors at the time of Hippi's inception.

With one of the most powerful data centers in the world and thousands of users nationwide, Los Alamos has over a dozen supercomputers from the likes of Cray Research, Inc. and Thinking Machines Corp.

Scientists run applications ranging from state-of-the-art graphics projects to visualization, in which a computer draws a moving picture of, for example, an astrophysics problem that would normally print out in thousands of printer pages of binary numbers. About 10 hours of Cray computational work may translate into a 30-sec. movie.

So the laboratory defined an 800M bit/sec. channel and proposed it to the American National Standards Institute (ANSI) X3T9.3 committee in March 1987. Los Alamos based its work on an existing internal channel standard, called the high-speed parallel interface, that had been developed in-house during the mid-1970s.



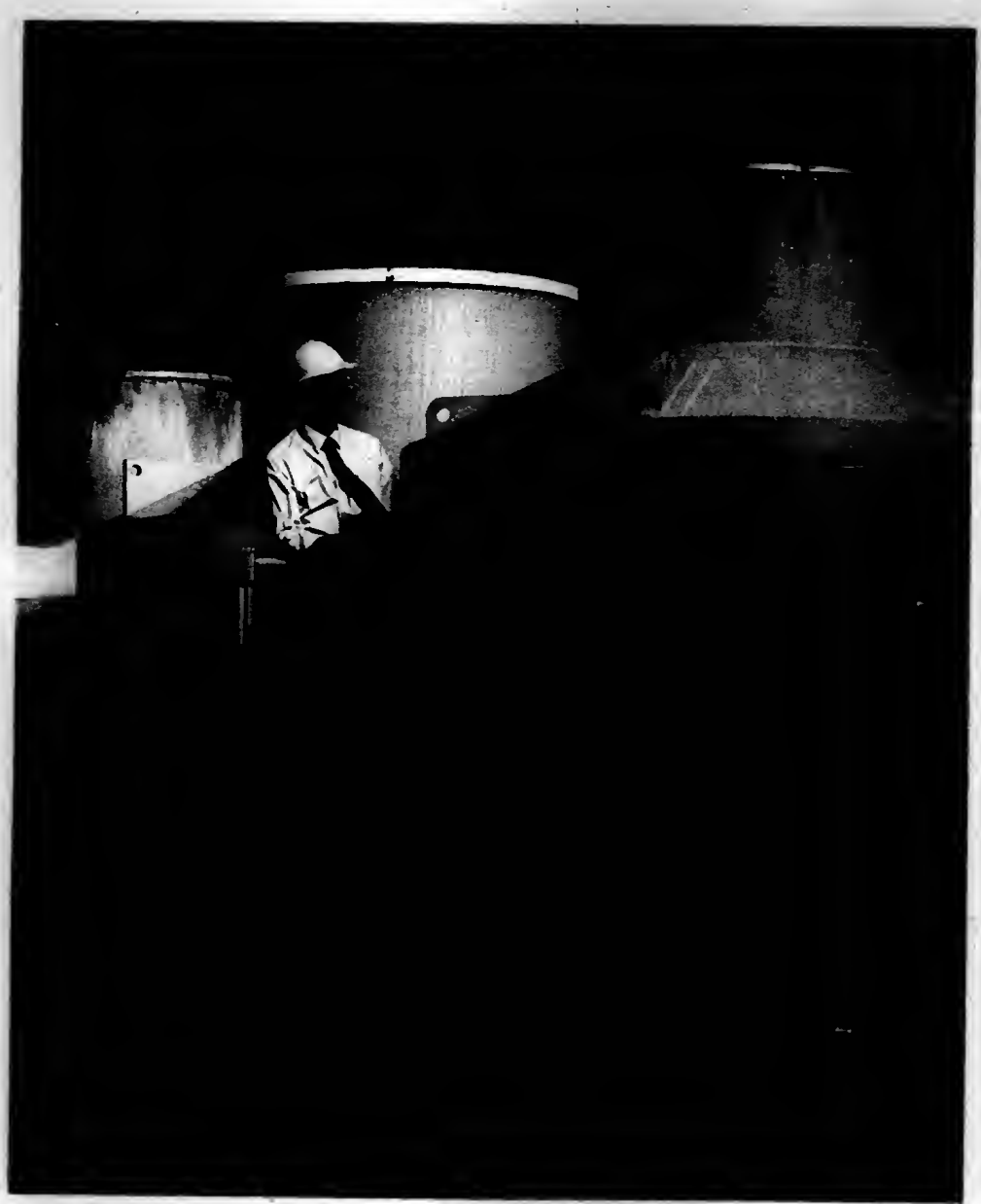
Weather maps *and other visual graphics could garner greater benefits from the Hippi standard*

"We were designing our own interfaces internally, and we didn't want to have to rebuild anymore," said Donald E. Tolmie, technical coordinator and leader of Los Alamos' standards committee at C-division, Los Alamos' internal computing division. "We thought, 'If it's a standard, we can get the vendors to spend their own nickel.' "

Tolmie said he received a "My gosh, this is the lunatic fringe" reaction when he first brought the Hippi prototype before the committee, but the laboratory mustered up enough vendor interest to convince the committee that there was a need for such high speeds. "We more or less overwhelmed the committee," he said.

Continued on page 48

NETWARE SOLVES ISSUES AT



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But open connectivity is only one consideration. After all, the EPA can't afford to test the waters with an unreliable network. So they use the only PC-based network operating system that's in its eighth generation. According to Stoneman, "We use NetWare for its reliability, advanced capabilities and functionality. It's easy to maintain, and we are very pleased with the security that NetWare provides."

In addition to sharing information and accessing several host systems, the EPA tracks cleanup efforts and communicates through E-mail over its NetWare network. All of which make for a very productive office environment. In fact, Stoneman attributes some significant cost savings to NetWare, "We no longer need a laser printer on every desk or 12,000 copies of dBase, Lotus and WordPerfect."

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'Hippi'

CONTINUED FROM PAGE 45

Hippi, with a bandwidth of 800M bit/sec. on a single copper cable and 1,600M bit/sec. with two cables, is really a point-to-point high-speed channel rather than an interface, said Wally St. John, a Los Alamos systems scientist involved with the project. The physical layer, which has been through two design reviews since it was submitted in March 1987, should be accepted as an ANSI standard soon, he said.

The channel is made up of shielded twisted-pair copper cabling. The maximum distance is 25 meters, although St. John said they have successfully run data at Hippi's lightning speeds at twice that distance, and at least two companies have products that will extend it onto fiber optics.

Los Alamos, which is using Hippi on a limited basis, has plans for the channel on several levels. It will be the basis for a local-area network for those scientists and users with a need for high-speed data transmissions, including researchers in the visualization laboratory, and will also serve as a backbone supporting such functions as data storage and archiving. "We handle such an enormous amount of data around here that we need those sorts of speeds to move it around," St. John said.

Los Alamos, which is "one of a tiny handful" of centers nationwide that has Hippi, hooks together its file system, data archival and visualization centers to supercomputers via what it calls a multiple crossbar network.

Using an internally developed crossbar interface, the laboratory can interconnect a fabric of crossbar switches to make the network arbitrarily large. The interface acts as a go-between from host to switch and between switches. According to St. John, "it takes what is a connection-oriented topology and turns it into a packet switch so the host doesn't have to worry about connections." St. John said users benefit because the ability of a source to deliver a package is based only on the destination being busy rather than anything in between.

The crossbar switches, which are circuit switches, were originally developed by Los Alamos. But St. John said Minneapolis-based Network Systems Corp. became interested in the technology and developed its own flavors from scratch.

Los Alamos is also part of a test bed that was put together by the Corporation for National Research Initiative to research high-speed networking at long distances. In the short term, the four participants of the program will have their Hippi-based LANs hooked via gateway to Synchronous Optical Network. "The immediate goal is 1G bit/sec. networking across the four sites," St. John said.

In the long term, the project will hook into the National Research and Education Network, a proposed high-speed backbone to hook together universities and research institutes nationwide.

BIT BLAST

Chipcom touts Token Ring

Smart-hub vendor Chipcom Corp. entered the Token Ring market last month when it announced a $1,195 module for its Online System Concentrator that supports 4M or 16M bit/sec. Token Ring networks running over shielded or unshielded twisted-pair wiring. The module joins Chipcom's existing Ethernet module. A company's Ethernet and Token Ring networks can be managed together using the existing Ethernet Management Module, according to Chipcom.

Videoconferencing equipment vendor **Videotelecom Corp.** and regional telecommunications carrier **Bellsouth Corp.** have inked a three-year agreement to jointly market Videotelecom's personal computer-based equipment and Southern Bell and South Central Bell digital transport services. Targeted applications will include "teletraining," business meetings and remote medical diagnostics.

Ram Mobile Data, Inc., which operates a nationwide mobile data communications network in the U.S., recently said it has selected Sears Business Centers as the systems integrator for the packet-switched radio network, providing systems design, training and support for turnkey private networks. In a separate agreement, **Ericsson GE Mobile Data, Inc.** said it has picked the Sears unit to market its mobile data products.

The first two commercial on-line information services to be available through an Integrated Services Digital Network (ISDN) connection were announced last month by **Mead Data Central, Inc.**, which will offer its Lexis and Nexis text databases via Illinois Bell Telephone Co.'s Basic Rate Interface ISDN service. Illinois Bell ISDN customers will be able to access the databases at 9.6K bit/sec., conduct research faster and cut on-line charges, the firm said.

"If GUI application developers could be ten times more productive, what would that do for client-server computing? We're about to find out."

In December, 1990, ASK Computer Systems acquired Ingres, the acclaimed manufacturer of intelligent relational database products. Here, CEO Sandy Kurtzig discusses the dramatic productivity increases reported by developers using INGRES/Windows 4GL, the first complete application development environment for graphical user interfaces:

"I don't see how anyone can keep from getting as excited as we are about client-server computing. The amount of information it puts at the fingertips of the end user is just phenomenal.

"You'll drastically reduce the code you now have to write."

"Of course, that much information can be frustrating—even useless—without an easier way of viewing it. That's where graphical user interfaces are coming into their own. They make vast amounts of data easy to work with, and quick to comprehend.

"But writing GUI applications using a conventional programming language is incredibly tedious. It requires hundreds of thousands of lines of code—60 percent of which do nothing but

Sniffer takes on distributed network analysis

BY JIM NASH
CW STAFF

MENLO PARK, Calif. — Network operating systems makers will not integrate their management products any time soon. At least, that is what Network General Corp. is banking on.

The maker of hardware-independent network monitors and analyzers announced its Distributed Sniffer system late last month. The system was designed to analyze network activity from the application down to the physical level using 120 protocols. Despite noting some shortcomings, network managers said they were happy with what they have seen of the product.

Distributed Sniffer combines features of Network General's Sniffer analyzer and Watchdog monitor with wide-area network capabilities, which both products have lacked. A spokesman for Network General said the company intends to take advantage of the fact that despite a great degree of heterogeneity among hardware on networks, few integrated management products have surfaced.

Scheduled for shipment in June, Distributed Sniffer is a server version of portable Sniffer and a central personal computer console. Servers were designed to sit on each segment of a network, monitoring events continuously. With the console, the company said, managers can view analyses compiled by each server. Servers will be priced from $4,995 to $10,995, depending on configuration; consoles will cost $7,995. Network administrators may find the console more troubling than any other feature of the product.

Joe McGrath, manager of corporate telecommunications at Millipore Corp. in Bedford, Mass., said only the console will be able to tap the screenless and keyboardless Sniffer servers. That means technicians with portable sniffers will be sent out to each segment having problems, McGrath explained. He said he would like to see at least some console features transferable to local workstations. Another administrator said he wants console abilities given to a Unix workstation as well as a PC.

Keep on running

With a large installed base of Sun Microsystems, Inc. workstations, Unix users may lose some capabilities by being forced to adopt a PC platform, said John Thomas, technology and development engineer at a Houston oil firm. Both Thomas and McGrath said Distributed Sniffer will aid them in keeping their networks running. They currently use Sniffers that only work on one network at a time.

After working with an alpha version, McGrath said, Distributed Sniffer "matches with what we are doing in a couple of ways. I have 10 Ethernet segments all over the country . . . with all kinds of hardware." He said that "even with Network General's current products, it's been tough [to manage]."

McGrath said he must now send a network engineer equipped with a Sniffer to each faltering segment. Each Sniffer costs $30,000, he explained. Distributing the analysis will be more cost-effective and less labor-intensive, McGrath said.

Thomas agreed, saying that with or without Distributed Sniffer, his company is cutting back its computer maintenance staff. Based on a preliminary evaluation he gave, he said the product could pay for itself in six months.

produce the GUI itself. Add that to the problems of accessing data from multiple sources, a shortage of developers, and a steep learning curve for existing GUI tools, and you're talking a huge investment of time and money. No wonder client-server applications have been so slow in coming.

"A product that makes programmers up to ten times more productive."

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Ingres

In December, 1990, Ingres Corporation was acquired by ASK. Fot mote than ten years, Ingres has been a worldwide technology leader in database management systems. The family of Ingres products includes: the first intelligent relational database; the first Windows 4GL development toolset; gateways to the most popular non-Ingres systems; powerful desktop solutions; and global customer support. Ingres' reputation for technological excellence was most recently confirmed by Digital Review—the magazine's 1990 Editor's Choice, Best Database Management Software, and Best Database Tools awards went to Ingres—as did the Sun Observers' excellence award for Best Database Management System.

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RS/6000 users gain fiber link

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — Users whose applications need the combined punch of reduced instruction set computing (RISC) and the speed of an optical network can now turn to a high-speed communications interface from Network Systems Corp.

The interface, which was developed in conjunction with IBM, works with the serial optical channel converter on IBM's RISC System/6000 workstations and servers and is the first attachment of its kind for the IBM boxes, according to Network Systems.

The interface provides eight connections, and an additional eight are offered as an option. It comes in two pieces: one for the workstation and one for the host. The preconfigured interface for the RS/6000 includes a Fiber Distributed Data Interface port and runs Transmission Control Protocol/Internet Protocol (TCP/IP) under IBM's AIX Version 3 Unix operating system.

A channel interface, to connect to a System/370 or System/390 host, is also available. On the host, the interface is supported by IBM's TCP/IP running MVS, VM or AIX.

In addition, the interface comes with Simple Network Management Protocol (SNMP) agent software, enabling the unit to be managed by IBM's host-based Netview network management system, which supports SNMP.

According to Network Systems, both the workstation and the host interfaces will be available in the fourth quarter.

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Europe

FROM PAGE 45

long way from being finished."

The private/public interconnection issue could carry an expensive price tag for firms such as Munich-based Daimler-Benz, which is currently implementing a private 14-node fast-packet network [CW, March 18]. The network will initially link five Daimler-Benz firms and ultimately provide commercial services as well. That venture could be more cost-effective if the German PTT would allow hybrid private/public link-ups, said Claus Weier, network planning engineer at Daimler-Benz's computing services branch.

More restrictions

Another common telecommunications restriction in Europe is the prohibition of the integration of voice and data in the public network. This means that firms must pay for separate lines to run different types of network traffic. This situation takes a big bite out of the cost efficiencies of service integration that have spurred many U.S. firms to embark on new applications.

"The European countries are all going digital, which means that there is no technical reason you can't intermingle [voice, data, video and facsimile] services," said Phil Evans, director of telecommunications at Dallas-based FMC Corp. and president of the 2,000 member-strong International Communications Association. "However, most PTTs see service integration as a deterrent to their well-being rather than as a stimulus."

Evans noted that in the U.S., FMC is turning to video, computer-aided design and engineering and other bandwidth-hungry applications because of the cost efficiencies of combining several services on common networks.

"While we're saving money overall, this situation allows us to offer the network much more massive amounts of data," he noted. By virtue of integrated services, FMC can expand its applications while giving its carrier a larger volume of business. FMC operates facilities in several European countries, where Evans said it may not be cost-justifiable to run those applications over separate networks.

"The PTTs are going to have to shrug off their 'lumbering giant' image and tidy up their operations into efficient marketing bodies," commented Richard Mitchell, associate director at Dataquest Europe, a research firm headquartered near London. While the PTTs and other carriers worldwide are committing serious dollars to network upgrades and worldwide telecommunications ventures (see chart page 45), "the PTTs are accustomed to being complacent and sluggish. They'll have to change their monopolistic thinking as they expand outside of their own borders," he said.

Mark Leary, director of communications research at Framingham, Mass.-based Technology Investment Strategies Corp., likens the situation to the regional Bell operating companies' (RBOC) struggle to be responsive to customer needs after a century of monolithic status.

"Like the PTTs, the RBOCs had always existed in a monopolistic vacuum and never had to think about what the consumer needed," he said. "Users simply got what the carriers provided."

NEW PRODUCTS

Local-area network software

CAL Emeritus Technologies Corp. has announced a local-area network archival software package designed to perform backup procedures from a file server without requiring any workstation intervention.

Tapeware Version 3.0 can operate on any workstation on a LAN that has received proper access rights. The product's Open Protocol Technology allows loadable network drivers to support various protocols, including Transmission Control Protocol/Internet Protocol and IBM's Netbios, simultaneously on a network.

The software package is available in versions for PC-DOS and Novell, Inc. Netware 286 and 386 operating systems. Pricing ranges from $325 to $995.

Emeritus
2750 N. Clovis Ave.
Fresno, Calif. 93727
(209) 292-8888

Ungermann-Bass, Inc. has announced an enhanced software package designed for its Maxtalk router.

The product supports Apple Computer, Inc.'s Appletalk Phase 2 protocol. It can also be used to search for names, locations or other data pertaining to single or multiple Macintosh systems, the vendor said.

The software is included with the Maxtalk multiport router ($4,695) and is scheduled to begin shipping in the second quarter. The product is offered free to Ungermann-Bass support customers and is priced at $250 for nonsupport customers.

Ungermann-Bass
3900 Freedom Circle
Santa Clara, Calif. 95054
(408) 562-7958

Revelation Technologies, Inc. has unveiled a software product that features configuration options for performing Revelation's Advanced Revelation applications on a Banyan Systems, Inc. Virtual Networking Software (Vines) network.

Advanced Revelation Lock Service for Vines ($295) is a personal computer-based software package that includes file- and record-locking services that allow network management procedures to be spread among multiple processors. The product also permits lock handling to be relocated from overloaded Vines servers to other, less overburdened servers on multiserver networks, according to the vendor.

Revelation Technologies
Two Park Ave.
New York, N.Y. 10016
(212) 689-1000

Customer-premises equipment

VMX, Inc. has introduced VMX 300, a platform that integrates voice messaging, call processing, interactive voice response, local or host database interaction, fax applications and electronic mail.

The product supports from 200 to 2,000 users, features between four and 32 ports and includes up to 350 hours of voice storage. It can operate as a single system that is integrated with a private branch exchange or a Centrex telephone system.

Pricing ranges from $50,000 to $395,000, depending on number of ports, size and number of disks available as well as number of software options.

VMX
2115 O'Nel Drive
San Jose, Calif. 95131
(408) 441-1166

Gateways, bridges, routers

Newport Systems Solutions, Inc.'s Lan²Lan/768 router is a device designed for Novell, Inc. Netware-based local-area networks that reportedly operates at speeds ranging from 9.6K bit/sec. to the highest fractional T1 speed of 768K bit/sec.

A basic version includes two ports and supports RS-232, V.35, RS-422 and X.21 line interfaces. The product can reportedly interconnect Ethernet, Token Ring or Arcnet LANs into a single internetwork.

The Lan²Lan/768 runs on a Netware file server or within a workstation as a dedicated or nondedicated external router. The basic version costs $2,695.

Newport Systems Solutions
4019 Westerly Place
Newport Beach, Calif.
92660
(714) 752-1511

Persoft, Inc. has announced Passage, a product that enables workstations on a Token Ring network to access host systems on an Ethernet local-area network.

The product can be used to connect a Token Ring workstation to Digital Equipment Corp. VAX/VMS or Unix-based hosts.

Passage comprises Token Ring and Ethernet network cards and runs on a dedicated IBM Personal Computer AT or compatible.

The product is priced at $5,995 for a 20-workstation license and $9,995 for a 50-workstation license.

Persoft
UW Research Park
465 Science Drive
Madison, Wis. 53711
(608) 273-6000

Micro-to-host

Visionware Ltd. has announced Version 4.0 of Xvision, its personal computer-based server for X Window System-based systems.

The product allows PCs networked via Transmission Control Protocol/Internet Protocol to one or more hosts to display multiple X clients alongside local Microsoft Corp. Windows programs. It also supports copying and pasting between DOS- and X-based systems, the vendor said.

Xvision Version 4.0 is priced at $449.

Visionware
57 Cardigan Lane
Leeds, UK LS4 2LE
(011 44) 53-2 78-88 58

Equinox Systems, Inc. has announced Megaplex-96, an I/O subsystem designed to connect terminal users to Unix-based AT or Extended Industry Standard Architecture bus-based computers.

A basic unit features a CMX-24 24-port cluster multiplexer designed to connect up to 24 terminal users to a host via a four-wire link. As more users, printers or modems are added to the network, Megaplex-96 can be expanded by adding additional CMX-24 devices to support up to 96 users, according to the vendor.

An entry-level 24-port configuration is priced at $2,395. Additional CMX-24 multiplexers may be purchased for $1,495 each.

Equinox Systems
14260 S.W. 119th Ave.
Miami, Fla. 33186
(305) 255-3500

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- ☐ Hardware/Software Contracts Administrators
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MANAGER'S JOURNAL

EXECUTIVE TRACK

Walter F. DuPont has been promoted to vice president of information services at Cooper Industries, Inc., a diversified manufacturer based in Houston.

DuPont had been director of information services at Cooper's corporate headquarters in Houston since 1979. Before moving to headquarters, he was director of information services at Cooper's Hand Tools Division in Raleigh, N.C.

Prior to that, DuPont was director of systems and data processing at scissors manufacturer J. Wiss & Sons, which was acquired by Cooper in 1976. He attended St. Anselm's College in Manchester, N.H.

.....

W. R. Berkley Corp. in Greenwich, Conn., has announced three appointments in information services at its subsidiary companies.

At Union Standard Insurance Co. in Dallas, **Curt Lyons** was promoted to vice president of information services, and **Greg Perkins** was named assistant vice president of information services. Union Standard developed the Dial-Us insurance agency interface system that is used by several other Berkley companies.

At Berkley Information Services, Inc. in Luverne, Minn., **James Burkett** was promoted to vice president of systems engineering. Berkley Information Services provides processing, support and internal technical consulting for Berkley companies.

.....

David O. Harper was named associate director of the Automotive Industry Action Group (AIAG), a Southfield, Mich.-based organization working to standardize business practices and technologies in the motor vehicle and automotive supplies industries.

Harper is General Motors Corp.'s executive-on-loan to the AIAG. He was most recently superintendent of material control at GM's Lansing Automotive Division. He is a graduate of the General Motors Institute.

Catch a ride on the fax wave

Computer-based fax services are challenging some IS managers to roll with the tide

BY MITCH BETTS
CW STAFF

The fax machine will probably never be an information systems manager's favorite technology. After all, IS professionals delight in enabling electronic file transfers and eliminating paperwork, not worrying about machines that spit out flimsy paper curls.

However, the tremendous growth in fax traffic and a new breed of computer-based fax technologies may force IS managers to start paying attention to the fax revolution.

While no one claims IS executives will wind up buying stand-alone fax machines — that will always be done by the same person who buys the office photocopier — experts say the IS department will have a role in integrating fax technology with the corporate information network.

"Right now, fax technology is *not* managed in corporate America," says Robert Rosenberg, research director at The Eastern Management Group in Parsippany, N.J. "But there are substantial savings and benefits to be had by putting fax in a network operations center."

Rosenberg predicts corporations will try to move their dial-up fax traffic onto private lines or use services such as MCI Communications Corp.'s dedicated fax network to save money and get centralized accounting. "People are just starting to realize how expensive fax can be," says analyst Judith A. Pirani at BIS Strategic Decisions in Norwell, Mass.

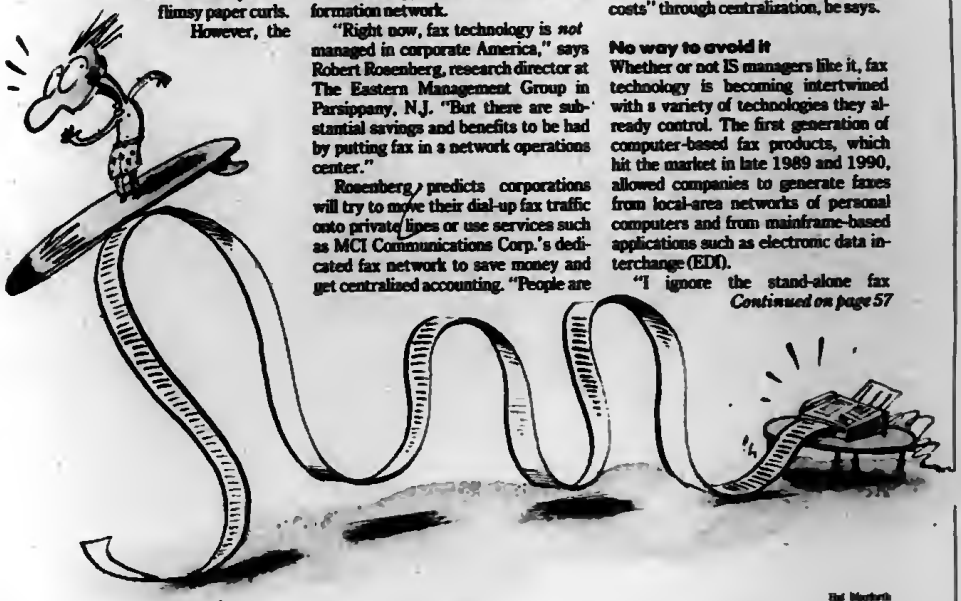
Charles Kropac, MIS director at New York-based Morrow & Co., a Wall Street proxy service firm, is a big fan of putting fax under the IS department's control. "When a company is sending out hundreds of thousands of faxes, you've got to get control of those fax costs" through centralization, he says.

No way to avoid it

Whether or not IS managers like it, fax technology is becoming intertwined with a variety of technologies they already control. The first generation of computer-based fax products, which hit the market in late 1989 and 1990, allowed companies to generate faxes from local-area networks of personal computers and from mainframe-based applications such as electronic data interchange (EDI).

"I ignore the stand-alone fax

Continued on page 57



Hal Mayforth

Sears fights back with 'smart store' showcase

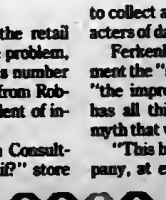
BY MICHAEL FITZGERALD
CW STAFF

The Merchant, as employees call the retail side of Sears, Roebuck and Co., has seen better days. This year, discounters K Mart Corp. and Wal-Mart Stores, Inc. will both move more goods than Sears.

Worse, Sears' nonretail subsidiaries — Allstate Insurance Co., investment firm Dean Witter Financial Services, Inc. and Coldwell Banker Real Estate Group, Inc. — now provide almost half of the firm's revenue and most of its profits, as the Merchant has been mired in a slump since the late 1980s. With $32 billion in revenue, the Merchant contributed just 21% of Sears' 1990 operating profit. Allstate, by contrast, brought in 58% of the profit on only $18 billion in revenue. There's even talk that the next Sears chairman will not come from the retail side for the first time in company history.

The sliding fortunes of the retail stores have created a morale problem, but Sears is battling back in a number of ways, one of which came from Robert J. Ferkenhoff, vice president of information systems.

After a tour of Andersen Consulting's Smart Store, a "what if?" store designed to show grocers what they could do with technology, Ferkenhoff decided to create a version of the store for Sears. But instead of being a store of possibilities, his store would use actual Sears technology.



Ferkenhoff's brainchild became the Sears Advantage, and it resides on the 51st floor of the Sears Tower in downtown Chicago. The Advantage replicates an actual Sears store, except you cannot buy anything there. What you can do is see the technology Sears uses to collect and process 1.4 trillion characters of data per month.

Ferkenhoff said he decided to implement the "store" to combat two myths: "the impression that the competition has all this stuff — and the second myth that we don't."

"This happens throughout the company, at every level, and I wanted to dispel the myths and to show people that we're real well-positioned and that our [information technology] is a competitive advantage," he said.

Since the Sears "smart" store went live in September, some 3,000 Sears employees have toured it. "It's terrific," said Pete Rector, manager of the Orland Park, Ill., Sears store. "As an end user, I knew what was there, but I had no idea how it originated, where the process took place or how it was stored. I got to see how it was used."

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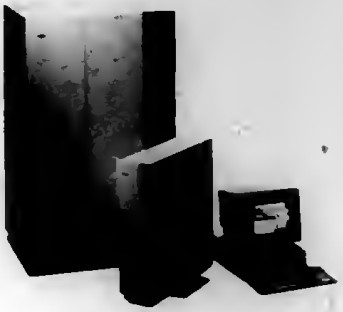

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Get your daily fax — interactively

Corporate and government departments that field public inquiries are finding more and more that people want to get information by fax. But that means having the staff repeatedly run to the fax machine to feed it.

To automate the process, some organizations are deploying technology that allows the public to dial into an interactive fax system and retrieve information from a computer database. Following a series of voice prompts, the customer can select a needed document and receive it via fax.

Hal Mayforth

For example, the U.S. Department of Agriculture in Washington, D.C., is using a system from Spectrafax Corp. in Naples, Fla., to provide press releases to the news media. Reporters can get a daily fax list of the agency's news releases and select the items they want, or they can automatically get every release at the end of the day, according to Diane O'Connor, deputy chief of the news division.

Hewlett-Packard Co.'s technical support desk is using the same technology to provide customers and dealers with the most sought-after fact sheets on the company's laser printers. The system is handling 5,000 calls per month and paid for itself in about nine months, says Susan Copple, customer support manager in Boise, Idaho.

MITCH BETTS

CALENDAR

APRIL 28 - MAY 4

Sepio & Sabbage User Group Conference. San Jose, Calif., April 28-May 1 — Contact: BBUG '91, Sunnyvale, Calif. (408) 720-0231.

Bull Users Conference. Phoenix, April 28-May 1 — Contact: Bull Users Society, Cherry Hill, N.J. (609) 429-0775.

Human Resource Systems Professionals Conference. Chicago, April 28-May 1 — Contact: The Association of Human Resource Systems Professionals, Dallas, Texas (214) 661-3727.

International Languages Conference. San Francisco, April 28-May 1 — Contact: Borland International, Scotts Valley, Calif. (408) 439-1619.

Human Factors in Computing Systems (CHI '91). New Orleans, April 28-May 2 — Contact: Tom MacHaffie, Conference Administrator, (503) 591-1981.

Focus Users Group '91. Anaheim, Calif., April 28-May 3 — Contact: Rosemary Mauro, Fuse, Inc., Marlboro, N.J. (201) 780-2185.

Downsizing the Corporate Information Systems. London, April 29-30 — Contact: Boston Systems Group, Boston, Mass. (617) 423-1670.

Eastern Communications Forum. Washington, D.C., April 29-May 1 — Contact: National Engineering Consortium, Chicago, Ill. (312) 938-3500.

Association for Information and Image Management Show and Conference. Washington, D.C., April 29-May 2 — Contact: AIIM, Silver Spring, Md. (301) 587-8202.

ISA Edmonton '91 Spring Symposium. Edmonton, Alberta, April 29-May 3 — Contact: Ian Verhappen, Committee General Chairman, Edmonton, Alberta (403) 790-7917.

MIS Training Week East '91. Atlanta, April 29-May 3 — Contact: Pamela Bimett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Bring Technology to Market. Palo Alto, Calif., April 30 — Contact: Nancy Pellerton, Regis McKenna, Palo Alto, Calif. (415) 354-4501.

Image Processing in Insurance. Dallas, April 30 — Contact: Infonet, Dallas, Texas (214) 746-3500.

Federal Computer Conference West. Anaheim, Calif., April 30-May 2 — Contact: Stephen O'Keeffe, National Council for Education on Information Strategies, Silver Spring, Md. (301) 587-9344.

Monterey Software Conference. Monterey, Calif., April 30-May 2 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Netcom. Hartford, Conn., May 1 — Contact: Daniels Productions, Hartford, Conn. (203) 561-3250.

Achieving 'Lights Out' Data Centers. May 2-3 — Contact: International Research, New York, N.Y. (212) 826-1260.

Instructional Computing Conference. Baltimore, May 2-3 — Contact: Lesley Robinson, Maryland Instructional Computer Coordinators Association, Denton, Md. (301) 479-1460.

From First. To Fastest.

Fax

CONTINUED FROM PAGE 53

machine, but when you hook up fax to my computers, then it becomes my property because I want to make sure it works for the user," says Warren Fay, director of IS at Vie De France Corp.'s Culinary Division in Alexandria, Va.

Vie De France uses a LAN-based fax server to broadcast 250 price quotes per week to the restaurants that buy its imported foods. Fay calls it "an elegant solution to a stupid problem," namely that it used to take more than five hours for a team of well-paid salespeople to manually feed the fax machine.

Fay adds that the fax application is also quite inexpensive: A $2,500 investment paid for itself in just eight weeks by reducing labor costs and making the salespeople more productive.

The computer-based fax market, however, is still in its infancy, and many IS managers seem unaware of the technology, according to a survey of 62 corporations taken by International Data Corp. (IDC) in Framingham, Mass. The products are sold by such little-known firms as Biscom, Inc. in Billerica, Mass.; Brooktrout Technology, Inc. in Needham, Mass.; Gammalink in Sunnyvale, Calif.; Spectrafax Corp. in Naples, Fla.; and Optus Software, Inc. in Somerset, N.J.

Some users in the IDC survey even showed an aversion to computer/fax connectivity. According to the study, "There was almost an attitude of fax being in a different sphere entirely from MIS. Numerous respondents felt fax purchase decisions were best left at the departmental level 'where they belong.'"

Fay explains the resistance to fax technology this way: "MIS managers, like most people, don't like change. How long ago was it that MIS managers looked at PCs and sneered?"

Many of the pioneering users say that automated faxing has become an integral part of the way they do business and may even provide a competitive advantage:

- The Canadian insurance operation of American International Group uses a LAN-based fax server to distribute 20,000 faxes per month to insurance brokers. The faxes include such critical documents as price quotes, policy terms, invoices and confirmation, according to Reg Monaghan, the business systems manager in Toronto.
- Miami-based Royal Caribbean Cruises Ltd. transmits reservations information from an IBM Application System/400 database as well as fare and itinerary changes and marketing information to 3,000 travel agents using computer-based fax technology, says David Hancock, director of field sales. He says competitors are building similar fax systems.
- The Optoelectronic Division of Siemens Components, Inc., based in Cupertino, Calif., uses a LAN gateway to fax production information to its factory in Malaysia, according to Ernie Burgos, production control manager.

In at least one industry niche — issuing truck permits — automated fax technology is a competitive necessity, according to Art Sahlstein, director of network operations at Cummins Cash & Information Services, a unit of Cummins Engine Co. in Columbus, Ind.

Cummins has a network of 3,000 fax machines at North American truck stops and uses a fault-tolerant mainframe to send truck permits to them automatically, "sometimes while the truck driver is still on the phone with us," Sahlstein says. The task was handled by telex in the 1960s, but "fax put Western Union out of the business of trucking permits," he adds.

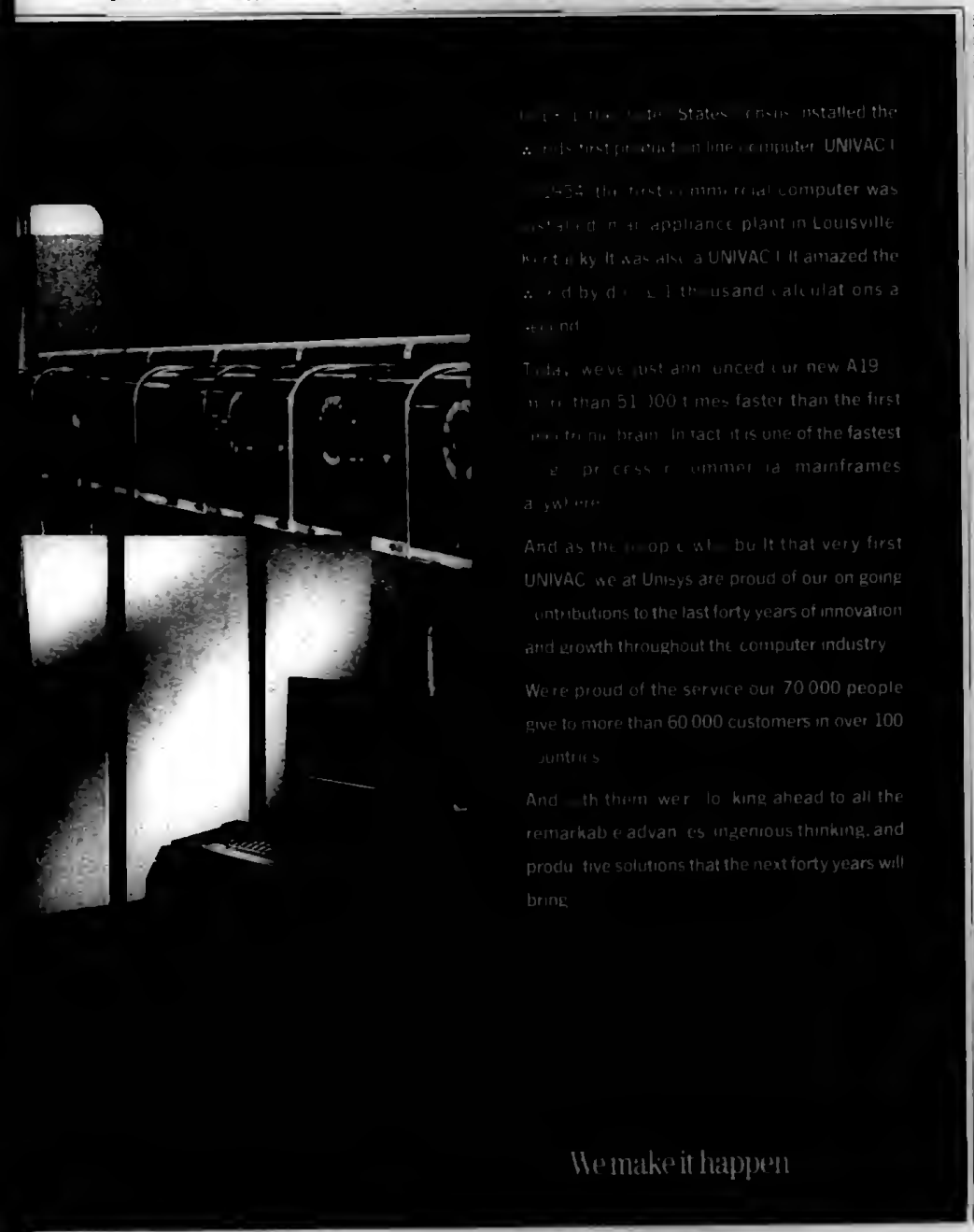
Whether or not IS managers like it, fax technology is becoming intertwined with a variety of technologies they already control.

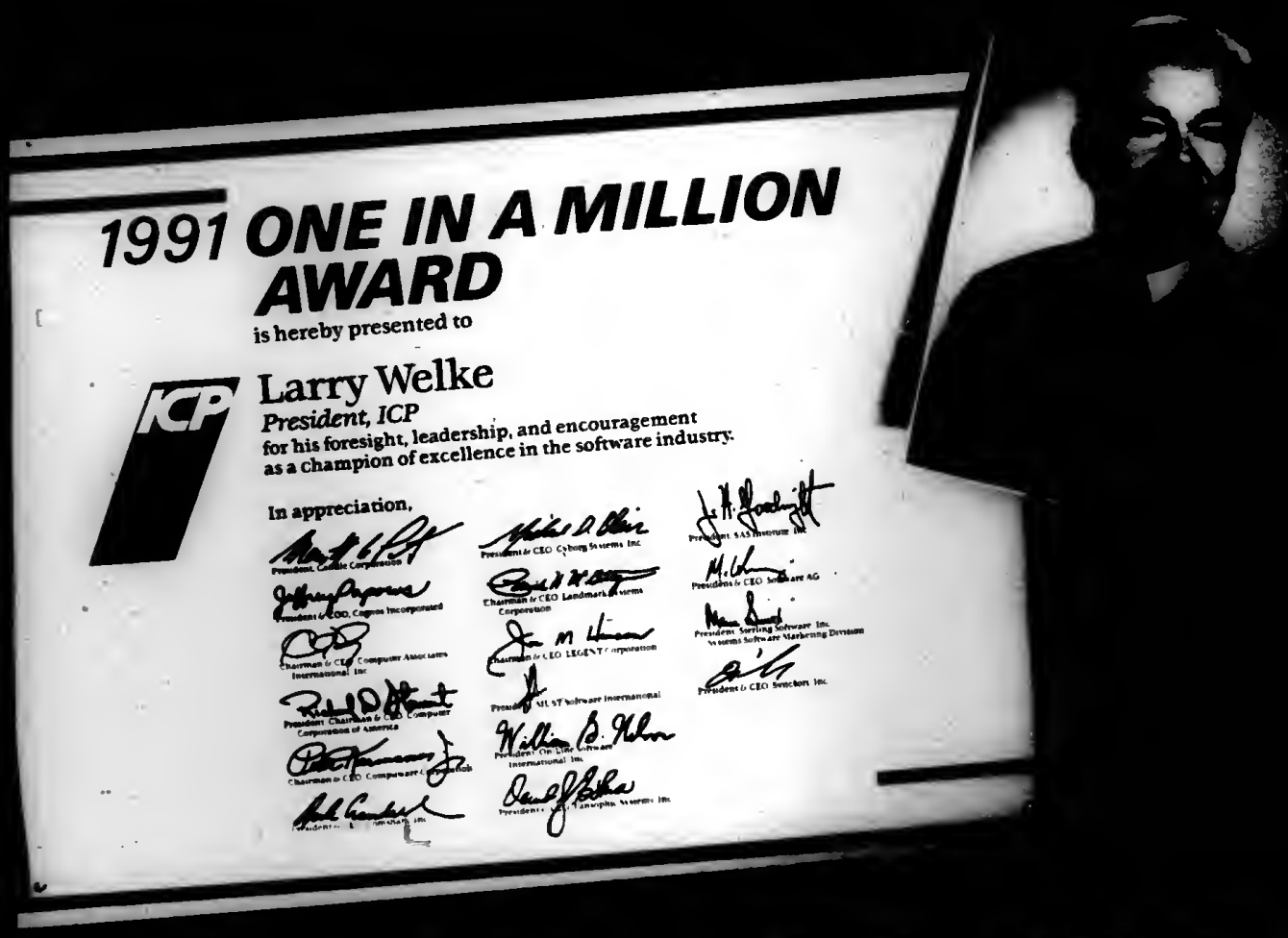
The ability to send faxes from electronic mail and EDI systems can make it possible for small customers or suppliers that lack computer resources to be part of a corporation's communications universe. For example, Citgo Petroleum Corp. in Tulsa, Okla., uses a mainframe-based fax system to send information to about 100 small distributors that do not participate in its EDI network.

Ideally, Citgo would like all of its business partners to be part of the electronic network, "but that's not going to happen in a lot of places because we're customer service-oriented, and we don't force them to computerize," says Rick Chern, a Citgo systems engineer. "We'll always be dealing with someone who hasn't implemented EDI."

Automated faxing can even create a rudimentary EDI-like network: Dow Chemical Canada, Inc. in Fort Saskatchewan, Alberta, uses its fax system to send E-mail, purchase orders and shipping information to its suppliers, totaling 70,000 messages per year, says Bob Wozney, a telecommunications specialist.

The computer-based fax products can also receive fax transmissions, but users complain that there are technical limitations at the receiving end, such as the difficulty of automatically routing the incoming faxes on the LAN, according to the IDC survey. Kropac says that "the ultimate fax product" would take an incoming, confidential fax with an electronic signature and route it to the recipient's electronic mailbox.





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SALES FORCE AUTOMATION

Metamorphosis of the salesperson

Current offerings run the gamut from efficiency improvers to job changers

BY ALAN J. RYAN

Forty-five minutes in a telephone booth with your ear pressed to a telephone receiver is, by most standards, a long time. And if you're a salesman awaiting information on the status of an order for your largest client, it can seem like forever.

For many of the sales representatives at The Pfaltzgraff Co., a tableware manufacturer in York, Pa., memories of the bad old days of "wait and you shall receive" are quickly fading.

By using sales force automation software running on their Grid Systems Corp. laptop computers, sales representatives can access the company's database to check on order status at their own convenience and in a lot less time.

Cutting down sales representatives' telephone time, which allows them to close more deals and cover more ground, is probably the most important benefit the company has derived from the system. But efficiency was not the main reason Pfaltzgraff invested in this software.

"We wanted to distinguish ourselves from all of our competitors," says Bill Bomberger, manager of sales marketing information services.

A representative toting a sleek laptop with software that provides access to product listings is much more impressive than one who fumbles through folders, price sheets and order books and then heads to the telephone to check on product availability.

The desire to improve sales force efficiency on some level is driving many companies to invest in sofware and systems for sales force automation. With more than 600 sales force automation products available, there is a package for just about every budget and every type of improvement.

Products sold under this label can be as simple as an off-the-shelf, single-function package running on a laptop or as complex as a vendor-customized, multifunction networked system.

David Diaz

Some were designed simply to streamline portions of the sales process; others transform it, giving the salesperson the ability to act as a consultant also.

Because Pfaltzgraff wanted to revamp its entire selling process, it selected a package from Modatech Systems, Inc. in Vancouver, British Columbia. Modatech, which tailors products for specific industries, customized the system for the sale of hard goods, which takes into account a seasonal selling period.

Such multifunction, multiuser packages that are customizable by the vendor or user are considered to be at the high end of the scale, selling for as much as $7,500 per sales rep for the software alone.

Once you add in training, hardware and support, typical prices range from $4,000 to $15,000 per sales representative.

These packages can encompass everything from lead generation to accounting, order entry, electronic data interchange, report generation and production planning. They also tend to reside on a minicomputer or mainframe. Sales reps access the system via a network with laptops or with personal computers.

At the opposite end of the scale are off-the-shelf, single-user, single-function packages that run on PCs or laptops and cost as little as $100 or less. Personal information managers and sales lead-generation software are typical packages that fall into this category.

Straddling the fence

What makes things confusing are products that fall in the middle ground. These offer any combination of functions typical of sales force automation software and tend to target medium-size businesses in terms of functionality and price. (For a complete list of typical functions on either high- or low-end and midrange packages, see page 60.)

Some of these middle-ground products are customizable, while others can be used off the shelf. A rule of thumb is that users can add flexibility and functionality by paying an accordingly higher price.

Another distinguishing factor of sales force automation software is whether it is built modularly or ready-made. With modular packages, the vendors (or a consultant) and the potential user piece together a system that best fits the needs of the sales organization.

Ready-made software builds in all the available functions, which can often be further customized for the customer. Both types can be found in all levels of the sales force automation software spectrum.

Like Pfaltzgraff, L.A. Gear, Inc. in Los Angeles also chose a high-end system to automate its 275-person sales force. The sports shoe manufacturer is installing software from Brock

Continued on page 60

Ryan is a *Computerworld* senior writer, features.

INSIDE

Carry What You Will
From laptops to palmtops to pen-based systems. Page 61.

Product Guide
A list of function-heavy sales force automation packages. Page 64.

Don't Expect Perfection
Even vertical packages require some tinkering. Page 70.

High interest rate

Automating the sales force does not appear to be a passing trend. In fact, it is a top-rated concern among information systems executives surveyed last fall by Index Group, Inc. in Cambridge, Mass.

The study polled 394 senior IS executives in large North American organizations. Forty-four percent of the respondents said they will make major information technology investments in the sales function and will make nearly equal investments in presale and postsale customer service at 43% and 48%, respectively.

Meanwhile, worldwide revenue for U.S. sales force automation will reach $103 million this year, a 39% increase compared with 1990's $75 million in sales force automation revenue, according to International Data Corp. in Framingham, Mass.

And that's a market in its early stages, the market research firm says. By 1994, annual revenue is estimated to reach $211 million.

Continued from page 59

Control Systems running on NEC Technologies, Inc.'s Ultralite laptops equipped with internal modems.

Mary O'Neill, financial/PC support services manager at L.A. Gear , says she expects the firm will save thousands of dollars with the software just by eliminating weekly mailings to the sales reps. She predicts the project to be paid off in its second year.

Aside from cost savings, however, the sports shoe manufacturer had two other goals in mind when it chose a high-end system.

First, it wanted to provide customers with more timely information and quicker turnaround on order placement. Second, it wanted to improve production cycle planning by having order information entered in a timely manner, tracking types and quantities of products ordered and being able to compare current demand vs. seasonal or historical trends.

At some point, O'Neill says, the system will be expanded to include interactive order placement with error checking as well as the capability to send new product specifications — including color line drawings of products — to representatives as soon as the new footwear products are released from the research and development laboratories.

Armed with this information, the sales rep can anticipate a customer's needs rather than simply reacting to them. He can alert clients to products not yet available for shipment and arrange for the items to ship automatically as soon as they are available.

In the event of an out-of-stock or otherwise unavailable item, the representative has access to a database to suggest an alternative product, possibly protecting the sale from a competing supplier.

Some companies are taking the advisory role a step further. At Hanes Hosiery, Inc. in Winston-Salem, N.C., a customized package working in tandem with a high-end, vertical industry system is turning sales reps into display consultants.

Hanes replaced an out-of-date sales system with high-end software from Envoy Systems Corp. in Waltham, Mass. A separately developed system called Planagram allows the sales representatives to help retailers design effective store displays for Hanes products, says Steve Jolley, systems manager for field sales and automatic reordering systems. Planagram, designed for Hanes by a private consultant, can also help in the planning of store promotions.

Envoy's approach to sales force automation is to build products for specific industries, including petroleum, apparel, speciality chemical and packaged goods (see story page 70).

Financial considerations

Although some companies want very much to provide better customer service, they don't want to break the bank to do so: "We wanted more than just sales information," says Craig Kendall, controller at Renex Corp., a manufacturer of computer data communications equipment in Woodbridge, Va. "We wanted information about our customers, products out there, their past purchasing history, their system environments, the Renex products already purchased, maintenance contracts and expiration dates."

The company did look at high-end offerings, but none fit Kendall's price range. Kendall shifted his focus to the midtier vendors and selected a product called SalesCNTL2 from Sales & Marketing Systems, Inc. in Vienna, Va. The product was a good fit because with only 11 salespeople throughout the country, Renex wanted a medium-price package with some of the functionality found in the more sophisticated sales force automation software.

Having all this information compiled in one place has helped the sales force win more contracts, Kendall says. When one customer wanted to upgrade all of its Renex units, the sales rep prepared the bid in two days, Kendall says, compared with what would have taken a couple of months on the old system. That order alone paid for the system, he says.

Further down the road, Kendall says, he would like to use the system to help customers measure the effectiveness of their advertising and marketing efforts.

Siemens-Nixdorf Printing Systems Ltd. in Boca Raton, Fla., also chose a midtier package, from Snap Software, Inc.

Domenick Caputo, vice president of sales at the high-end printer firm, says the $50,000 to $60,000 he spent on software plus $150,000 for hardware was well worth the price; many members of the 45-person sales team say they cannot live without the hardware and software.

Snap worked with Siemens to incorporate a database from Computer Intelligence into its package. This database provides information such as installed bases of printers and companies with plans to buy printers.

No matter what technology they wield, however, salespeople will still need to be equipped with sales mentalities and the basic principles of sales, says Jack Criswell, executive director at Cleveland-based Sales and Marketing Executives International, a 10,000-member sales executive organization.

Salespeople "still have to sell and understand the fundamentals of selling," Criswell says. Automation merely allows them to maximize their efforts. ●

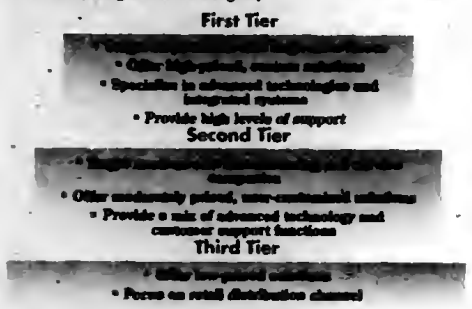
Common features

While it is difficult to label any sales force automation software "typical," some of the most frequently available options in either modular or ready-made software include any combination of the following capabilities:

- Tracking of sales leads, expenses, inventory, historical customer information and production dates.
- Remote order entry via modem.
- Access to financial data and electronic product catalogs, which can either be downloaded to the laptop on a regular basis or accessed online as necessary.
- Sending and receiving electronic mail, reports, follow-up or query letters, product updates, etc. among representatives and their managers and others in the home office.
- Sales territory realignment.
- Access to information on competitors and markets.
- Sales representative monitoring by headquarters.
- Electronic data interchange with customers.

Levels of automation

IDC divides sales force automation software vendors into three tiers, with most falling into the middle group



*Source: International Data Corp. CW Chart: Doreen St. John

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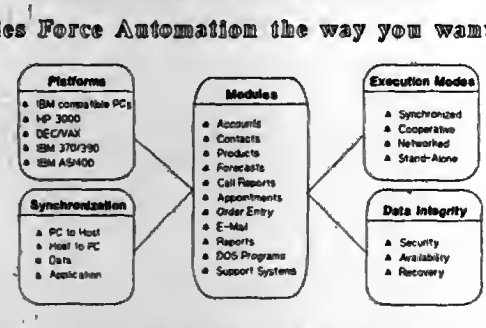

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Hardware, from lap-size to hand-size

BY MEL MANDELL

The laptop computer is the dominant platform in field sales force automation, but it isn't the only one. From one-pounders to pen-based systems, field agents have a wide range of choices.

• **Electronic organizers.** One of the smaller options is the electronic organizer, which fits in a jacket pocket. This device is favored by insurance agents, such as the 10,000 Prudential Insurance Co. field agents who store their rate databases in the Wizard from Sharp Electronics in Mahwah, N.J.

Read-only memory cards for each category of insurance can be inserted into the Wizard to display rates on the little LCD. The 10-oz. device is currently selling at a discount in stores for $200.

• **Handheld transaction computers.** Another popular device is the handheld transaction computer, which is used by route salespeople serving supermarkets and other food outlets. These sales agents need a computer they can hold in one hand so they can walk aisles and key in data at the same time.

Handheld transaction computers resemble walkie-talkies and are loaded with custom software.

They are typically configured to plug into a printer mounted in the salesperson's vehicle to generate a copy of the order for the customer.

Manufacturers of small-screen handheld transaction computers include Norand Corp. in Cedar Rapids, Iowa, Symbolics-MSI in Bohemia, N.Y., and Telxon Corp. in Akron, Ohio.

• **Pen-based computers.** A device currently receiving a lot of attention from users and vendors is the pen-based computer. Sales agents at Kellogg Co. are early users of the stylus-based Gridpad from Grid Systems Corp. in Fremont, Calif.

Kellogg field personnel visiting supermarkets not only gather orders but also report how their own and competing products are displayed.

Agents enter most information by touching fields on preset screens on the stylus display. Handwriting is used only to enter short notes or exception information not included on a programmed screen.

Grid currently dominates the pen-based market, but other pen input computers are expected to be introduced before the end of this year by such firms as IBM and NCR Corp.

Envoy Systems Corp. in Waltham, Mass., is adapting its sales force automation software to work on future pen-based computers using the Penpoint operating system currently under development by Go Corp. in Foster City, Calif.

Similar in function and appearance is the Datellite from Canadian-based Microslate, Inc.

Instead of a stylus, users activate fields on the display of this 6.7-pound device with their fingertips. They enter variant data by calling up a representation of a standard keyboard and touching the appropriate letters.

• **Palmtop computers.** Palmtop computers from Poget Computer Corp. and Atari Corp. are being adapted to gather orders and other sales-related information, but so far, there are no packages available.

Because their keyboards are so small, data is entered by two-finger keyboarding. Palmtops offer much less data storage than notebook or laptop computers, but it may be enough storage for those who sell limited lines.

The one-pounders are also too small to accommodate internal modems; instead, agents can use external, cigarette package-size modems, such as the Worldport 9600 from Touchbase Systems, Inc. in Northport, N.Y.

The next trend will no doubt be wireless transmission of urgent orders or queries via radio-equipped portable devices. Handheld transaction computers already offer short-range, two-way radio communications. •

Mandell is a New York-based free-lance writer.

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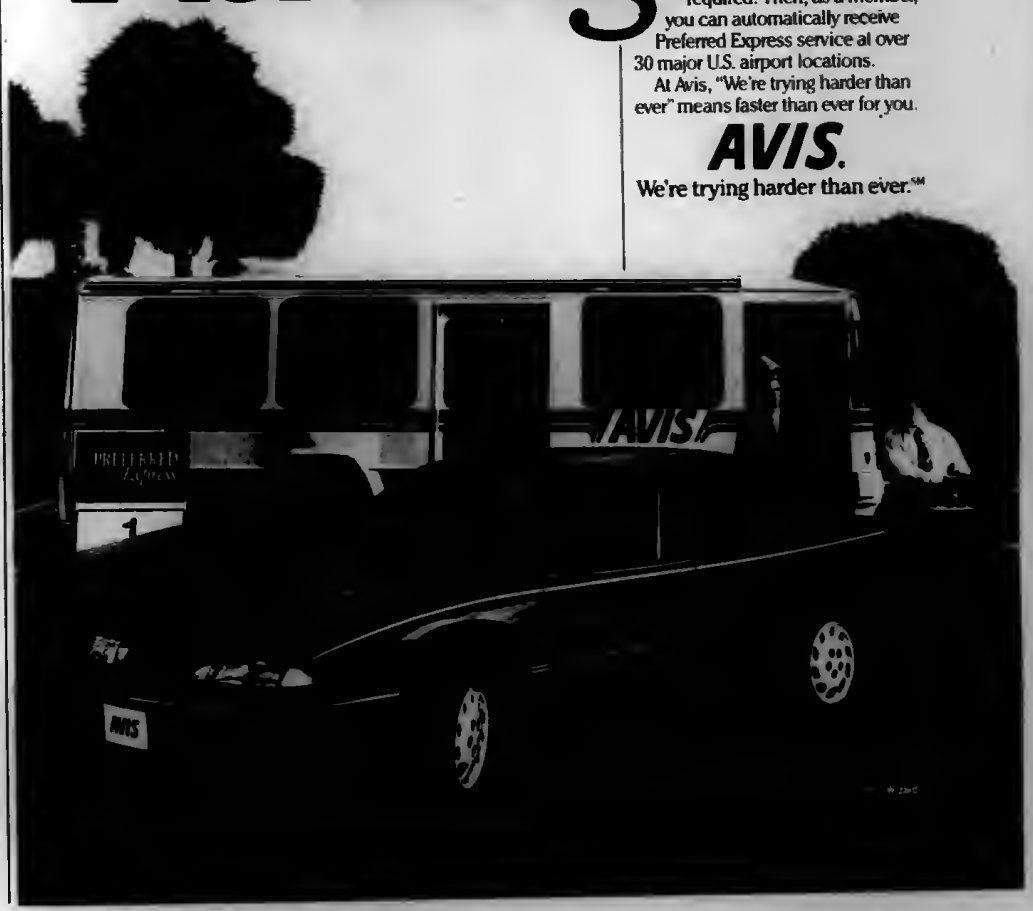

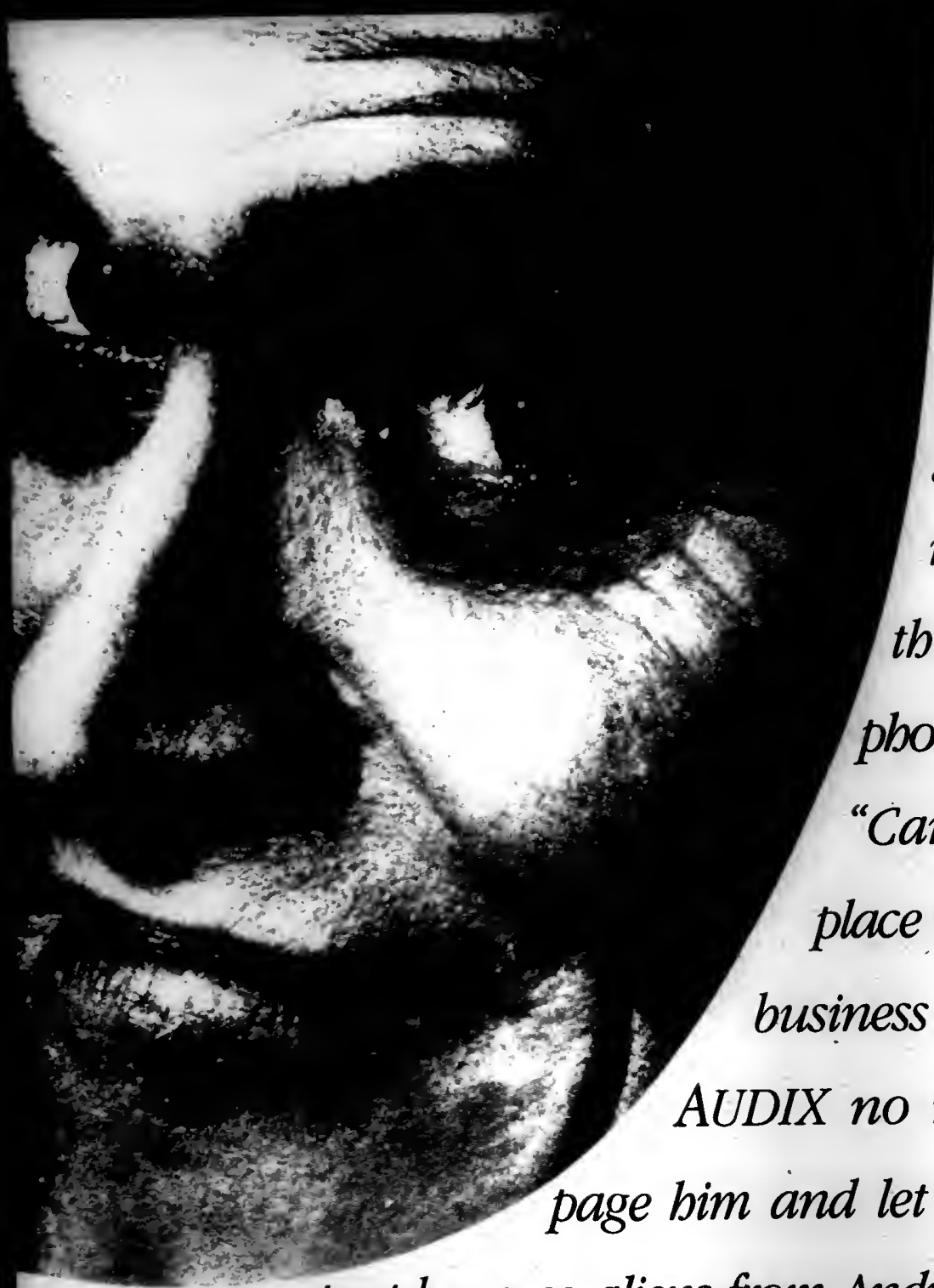

We send
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reason I'm
third call to
phone because
"Can I take a
place that has an
business calls don't
AUDIX no message is
page him and let him know
tant because aliens from Andromeda are
At this point I'm put on hold. And it is my hope that if
not currently suffering the indignity of the hold button.

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up satellites like flowers to strangers. On one we
electronic greeting card and addressed it to infinity.
occurs to me, what if the people who might get
signal from planet Earth aren't around when it
What if they're in a meeting? And the only
thinking this is because I'm on the tenth ring of the
this supplier when someone finally answers the
the ringing noise is ruining his lunch. He says,
message?" And I say, "Tell Ray he needs to work for a
AUDIX System from AT&T. Tell him 75% of all
reach their intended party on the first try. But with
missed. Tell him AUDIX features outcalling that can
important messages are waiting. And this is impor-
trying to reach him and they may not call back...."
there is intelligent life somewhere in the universe, it is

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The right choice.

Field sales force automation software[1]

VENDOR	PRODUCT	FEATURES	HARDWARE PLATFORM	MEMORY/DISK REQUIREMENTS	MODE OF OPERATION	CONFIGURATION	DATABASE INTERFACED WITH	INTEGRATED E-MAIL	INTEGRATED FAX BOARD	REPORT WRITER	CUSTOM GRAPHICS FOR PRESENTATIONS	APPLICATIONS INTEGRATED WITH	SERVICES	PRICE (SINGLE USER/MULTIUSER)
Allied Automation, Inc. (617) 273-0383	Callback 4.1	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, problem tracking, territory/account management, trade leads, hotlist, memos, user-definable fields for any customization	All Oracle-supported platforms	Dependent on platform and number of users	Control host	Modular	Oracle required	No	Optional	Yes	Optional	Word processing, spreadsheets	Training at customer site, phone support	Varies
Advanced Marketing Systems Corp. (508) 393-6366	Computer Aided Selling	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing	DEC VAX, IBM PCs and compatibles, LANs	640K/20M, hard disk required	Stand-alone, control host, LAN	Custom	Interfaces with any database	Optional	Optional	Optional	Optional	Word processing, spreadsheets, graphics	Training at customer site, phone support	NA/$30,000 (10 users)
Argument Systems (408) 867-5020	Field Sales Manager	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, territory/account management, order entry	IBM PCs and compatibles	512K/1.5M, hard disk required	Stand-alone	Neither	None	No	No	No	No	Word processing	Phone support	$189
Arlington Software & Systems (303) 230-1733	PC/AT Version 5.2 and 6.0	Customer database, mail merge, reporting, scheduling, problem tracking, call scheduling, contact history, word processor, report generator	IBM PCs and compatibles	512K/1M, hard disk required	Stand-alone, LAN	Modular, custom	Btrieve	No	No	Yes	No	None	Training at customer site, phone support	$195/$595 (4 users, Version 5.2), $595/$1,395 (4 users, Version 6.0)
Bartel Software, Inc. (801) 566-6644	Tenth Manager Version 2.15	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry/processing, customer billing, market plans, expense tracking	IBM PC AT, Intel 80386-based machines and compatibles	480K/1.2M, hard disk required	Stand-alone, LAN	Modular, custom	Dbase III+	No	Yes	Yes	No	Word processing, spreadsheets, graphics	Training at customer site, phone support	$495/$1,995 (5 users)
Breakthrough Productions (916) 265-0911	Market Master for the Macintosh	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, territory/account management, automatic follow-up, updating	Apple Macintosh	2M/Hard disk required	Stand-alone, central host	Modular	Double helix	No	No	No	No	None	Phone support	$395/$495 (4 nodes) plus $150 each additional node
Brock Control Systems, Inc. (404) 431-1500 (800) 221-0775	Field Activity Manager (part of Brock Activity Manager series)	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, sales reference library, productivity tools, reports via "query by example"	All Unix platforms	2M/150M, hard disk required	Control host, LAN	Modular, custom	Informix	Yes	Optional	Yes	No	Word processing, spreadsheets, graphics, other off-the-shelf packages	Training at customer site, phone support	$1,500 - $2,800 (per user), 3-user minimum
Contact Plus Corp. (505) 881-3223	Contact Plus Professional 3.0, Contact Plus LAN	Customer database, activity planner, mail merge reporting, problem tracking, tickler, appointment manager, call history, correspondence management	IBM PCs and compatibles	512K/1M, hard disk recommended	Stand-alone, LAN	Modular	None	No	No	No	No	Dbase, Wordperfect, Wordstar, Xywrite, Calendar Creator Plus	Optional training, free phone support during business hours	$250/$695 (5 users)
Contact Software International, Inc. (516) 418-1000	ACT! Version 2.0	Customer database and purchase history files, activity planner, mail merge, custom reporting, scheduling, territory/account management, contact information management	IBM PCs and compatibles,	640K/2M, hard disk required	Stand-alone, LAN	Modular	Proprietary	No	No	Yes	No	None	Phone support	$395/$695 (ACT Server Plus Only/ $1,295 (ACT 5-user network)
Crough Computer Systems (619) 792-1367	Personal BarTime 2.1	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, complete inventory tracking and invoicing	IBM PCs and compatibles	640K/2.5M - 3.5M 20M hard disk recommended	LAN	Neither	Internal database	Optional	Optional	Yes	No	Word processing	Phone support, fax	$69.95/NA
	BarTime Gold 2.1	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, complete inventory tracking and invoicing	IBM PCs and compatibles	640K/2.5M - 3.5M 20M hard disk recommended	Stand-alone, LAN	Custom	Internal database	Optional	Optional	Yes	No	Word processing	Phone support, fax	$395/$995 (4 users), $1,495 (8 users), $1,995 (9 - 99 users)
Daylo Software Corp. (714) 474-3901 (800) 367-5360	Daylo Tracker 1.6	Customer database, activity planner, mail merge, forecasting, quoting, reporting, scheduling, territory/account management, client, prospect and contact tracking, good notes capabilities for long-term sales	IBM PCs and compatibles	384K/2M, hard disk required	Stand-alone	Custom	Daylo is a database	No	Optional	Yes	No	Word processing, spreadsheet	Training at customer site, phone support	$195/$495 (4 users)
Eighty/20 Software (507) 345-8020	Eighty/20 Advanced Version 2.23	Customer database and purchase history files, activity planner, mail merge, quoting, reporting, scheduling, territory/account management, prospect customer tracking, calendar, telemarketing scripts, expense tracking	IBM PCs and compatibles	480K/1M, hard disk recommended	Stand-alone LAN	Modular	Clipper, Dbase	No	No	Yes	No	None	Training at customer site, phone support	$395/$1,295 (unlimited users)
	Eighty/20 Professional Version 3.0	Customer database and purchase history files, activity planner, mail merge reporting, scheduling, territory/account management	IBM PCs and compatibles	450K/1.5M hard disk required	Stand-alone, LAN	Modular, custom	Clipper, Dbase	No	Yes	Yes	No	Word processing, spreadsheets	Training at customer site, phone support	$595/$1,595 (5 users)
Endpoint Marketing Information Systems (408) 737-3031	Lead! 1.1	Customer database, activity planner, mail merge, reporting, scheduling, problem tracking, contact and follow-up management, lead and source analysis, literature and fulfillment tracking, volume lead capture and entry functions	Macintosh SE/30 and above	1M/4M, hard disk required	Stand-alone, LAN	Modular	4th Dimension included	No	No	Yes	No	Word processing	Training at customer site, phone support	$1,795, $500 each additional copy
Envoy Systems Corp. (617) 890-1444	The Envoy Salesmate Entry Level System	Reports request and distribution, electronic forms, flexible data query, data compression and error checking, on-line access, personal information management	DEC VAX, IBM PCs and compatibles, PS/2, IBM 370	614K/20M, hard disk required	Stand-alone, central host, distributed system	Custom	Oracle (VMS), SQL (VM), Clipper (DOS), DB2	Yes	No	Yes	Export to Harvard graphics optional	Spreadsheets, graphics	Training at customer site, phone support, seven-day hot line, full documentation	NA/$500,000 - $750,000 (complete system for 100 users, depending on level of customization and functionality)
	The Envoy Salesmate System for the Petroleum Industry	Customer database and purchase records, activity planning, electronic reporting, scheduling, territory/account management, special price agreements, product price look-ups, customer notes and contacts, call plans and call reporting, personal information management	DEC VAX, IBM PCs and compatibles, PS/2, IBM 370	614K/20M, hard disk required	Stand-alone, central host, distributed system	Custom	Oracle (VMS), SQL (VM), Clipper (DOS), DB2	Yes	No	Yes	Export to Harvard graphics optional	Spreadsheets, graphics	Training at customer site, phone support, seven-day hot line, full documentation	NA/$500,000 - $750,000 (complete system for 100 users, depending on level of customization, and functionality)

[1]Most vendors listed correspond to the second and third tier of International Data Corp.'s definitions of sales force automation software from the market research report "Sales Force Automation Software" (December 1990). Definitions appear on page 60. Vendor names were compiled from that report and Information Systems Marketing, Inc.'s 1990/1991 Guide to Sales and Marketing Automation.

For information on Telemagic from Remote Control International, call the vendor at (619) 431-4000, as product information was unavailable at press time. The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	FEATURES	HARDWARE PLATFORM	MEMORY/DISK REQUIREMENTS	MODE OF OPERATION	CONFIGURATION	DATABASE INTERFACED WITH	INTEGRATED E-MAIL	INTEGRATED FAX BOARD	REPORT WRITER	CUSTOM GRAPHICS FOR PRESENTATIONS	APPLICATIONS INTEGRATED WITH	SERVICES	PRICE (SINGLE USER/MULTIUSER)
Envoy Systems (cont.)	The Envoy Salesmate System for the Specialty Chemical Industry	Customer database and purchase records, activity planner, electronic reporting, scheduling, problem tracking, territory/account management, inbound service and sample tracking, call plans and call reporting, customer notes and contacts, personal information management	DEC VAX, IBM PCs and compatibles, PS/2, IBM 370	614K/800K, hard disk required	Stand-alone, central host, distributed system	Custom	Oracle (VMS), SQL (VM), Clipper (DOS), DB2	Yes	No	Yes	Export to Harvard graphics optional	Spreadsheets, graphics	Training at customer site, phone support, seven-day hot line, full documentation	NA/$9500.000 - $750,000 (complete system for 100 users, depending on level of customization, and functionality)
	The Envoy Salesmate System for the Packaged Goods Industry	Customer database and purchase records, activity planner, forecasting (individual and consolidated), electronic reporting, scheduling, territory/account management, order entry, stock and chain supplier profiles, fund allocation, call planning and call reporting, personal information management	DEC VAX, IBM PCs and compatibles, PS/2, IBM 370	614K/800K, hard disk required	Stand-alone, central host, distributed system	Custom	Oracle (VMS), SQL (VM), Clipper (DOS), DB2	Yes	No	Yes	Export to Harvard graphics optional	Spreadsheets, graphics	Training at customer site, phone support, seven-day hot line, full documentation	NA/$600,000 - $750,000 (complete system for 100 users, depending on level of customization, and functionality)
	The Envoy Salesmate System for the Apparel Industry	Customer database and purchase records, activity planner, electronic reporting, scheduling, territory/account management, order entry, promotion orders, inventory stock counts, product price and promotion look-ups, personal information management	DEC VAX, IBM PCs and compatibles, PS/2, IBM 370	614K/800K, hard disk required	Stand-alone, central host, distributed system	Custom	Oracle (VMS), SQL (VM), Clipper (DOS), DB2	Yes	No	Yes	Export to Harvard graphics optional	Spreadsheets, graphics	Training at customer site, phone support, seven-day hot line, full documentation	NA/$600,000 - $750,000 (complete system for 100 users, depending on level of customization, and functionality)
Excaliber Sources, Inc. (404) 956-8373	Excell 3.05	Customer database and purchase history files, activity planner, mail merge, quoting, reporting, problem tracking, territory/ account management, customer billing, automated tickler file, complete contact management capabilities	IBM PCs and compatibles, all networks	512K/1M, hard disk recommended	Stand-alone, LAN	Modular, custom	None	No	No	Yes	No	Word processing, spreadsheets	Training at customer site, phone support	$395/$1,495 (5 users)
Fairfield Management Resources, Inc. (708) 705-0141	Relationship Management System	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, territory/account management, sales planning, pipeline reports, call history	IBM PCs and compatibles, PC LANs	512K/Minimum of 1M, hard disk required	Stand-alone, LAN, WAN	Modular, custom	None	Yes	Optional	Yes	No	None	Training at customer site, phone support	$300 - $1,000/ $400 - $1,200 per user, depending on volume and customization
Fastech, Inc. (215) 565-3405	Sales Information System	Customer database and purchase history files, reporting, scheduling, territory/ account management, order entry, retail conditions, promotions tracking	DEC VAX, IBM mainframes, laptops, handheld, pen-based systems	Varies	Central host	Modular, custom	Adabas, DB2	Yes	Optional	Yes	Optional	Word processing, spreadsheets, graphics	Training at customer site, phone support	NA, $100,000 +, depending on volume and customization
Follow-Up Software Co. (210) 680-9788 (800) 426-8467	Follow-Up Version 99	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, letter writing, report generator calendar, custom manager	IBM PCs and compatibles	384K/700K, hard disk recommended	Stand-alone, LAN	Modular	None	No	No	Yes	No	Word processing	Phone support	$399.95/$995 (5 users)
Gateway Systems Corp. (517) 349-7740	Synergist Sales Portfolio	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, reminder directory, time-management, support systems	DEC VAX, HP 3000, IBM 370/390, AS/400, PS/2, PCs and compatibles	640K/2M, hard disk required	Stand-alone, central, LAN, synchronized, cooperative processing	Modular, custom	R:Base, db-Vista required (for PC), KSAM, Image, HP-SQL, Turbo Image, RDB, RMS, SQL/DS, DB/2, AS/400 Native DBMS	Yes	Optional	Optional	Optional	Word processing, spreadsheets, graphics, any ASCII files	Training at customer site, phone support, one-year warranty, updates provided	NA/Variable, depending on host/server and number of users
GE Information Services (301) 340-4000	Sales Marketing Communication System	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, inventory management, control bulletin boards, databases	IBM PCs and compatibles	640K/HK +, hard disk required	Stand-alone, LAN, integrates into existing system	Modular, custom	Btrieve	Yes	Optional	Yes	Optional	Word processing, spreadsheets, graphics	Training at customer site, phone support, 24-hour, seven-day hot line, international/ multinational support	Dependent on volume
High Caliber Systems, Inc. (212) 684-5553	People Base Version 3.2	Customer database and purchase history files, activity planner, mail merge, reporting, territory/account management	IBM PCs and compatibles	512K/1M, hard disk required	Stand-alone, LAN	NP	Dbase III compatible files	No	No	Optional	No	Word processing, spreadsheets	Training at customer site, phone support	$199/$495 (unlimited users)
Information Resources, Inc. (617) 868-1300	Express Sales Management System	Customer purchase history files, forecasting, reporting, problem tracking, territory/account management, distributed application, automatic update, output to files and spreadsheets	IBM PCs and compatibles, LANs, DEC, HP, IBM, Prime workstations and minicomputers	384MM recommended, 1.8M hard disk required	Stand-alone, central host, LAN	Modular, custom	Access database through embedded SQL	Optional	No	Yes	No	Word processing, spreadsheets	Training at customer site, phone support, installation consulting and documentation	NA/$30,000 (5 users)
Information Systems Experts, Inc. (202) 363-6006	SAM	Customer database and purchase history files, activity planner, mail merge, reporting, scheduling, territory/account management, order entry	IBM PCs and compatibles, DEC, AT&T, HP	640K/20M, hard disk required	LAN	Modular	None	Yes	Yes	Yes	No	Word processing	Training at customer site, phone support, 24-hour, seven-day hot line	NA/$5,000 - $25,000
Intelligent Information Systems, Inc. (412) 681-9000	IntelliSuite Version 1.0	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, problem tracking, total database query, integrated correspondence and report generation	DEC VAX, HCR, Sun Microsystems, IBM PCs and compatibles	Varies, hard disk required	Central host, LAN	Custom	SQL-compliant databases required	Yes	No	Yes	No	Word processing, spreadsheets, user-defined	Training at customer site, phone support, business hours hot line	NA/$15,000 (10 users), $1,000 - $1,500 per user, depending on platform and customization
JES Systems, Inc. (603) 883-4663	MMS/Plus, MMS/Remote, MMS/PT	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, problem tracking, territory/account management, order entry	DEC VAX, IBM PCs and compatibles	Varies	Stand-alone, central host, LAN	Modular, custom	Informix, Oracle, RDB, Powerhouse	No	No	Optional	Optional	Word processing, spreadsheets, graphics	Training at customer site, phone support	$595 - $2,500/ $6,000 - $20,000 (100 users)
JEL Marketing (314) 291-1367	Sales/ Marketing Solution System	Customer database, activity planner, mail merge, forecasting, quoting, reporting, scheduling, territory/account management, qualification tracking, telemarketing, personal management reporting	IBM PCs, PS/2 (either order DOS or Unix)	640K/80M, hard disk required	Stand-alone, LAN	Modular	Dbase, Database, ASCII	Optional	Optional	Yes	Optional	Word processing, spreadsheets	Training at customer site, phone support	$1,495 (DOS)/$3,495 (Unix-based optional
Key Systems, Inc. (502) 897-3332 (800) 227-0575	Prospecting Plus Release 8.3	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, scheduling, bulk mail manager, extensive free-form notes	IBM PCs and compatibles, LAN, Unix, Xenix	400K/1.5M, hard disk recommended	Stand-alone, central host, LAN	Modular	None	No	No	No	No	None	Phone support	$495/$1,485 + (5 users on LAN, 25 users on Unix)
Lee Allen Software (412) 943-0030	Pinnacle 3000	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, territory/account management, order entry, customer billing, lead tracking, telemarketing	HP 3000 Classic and Spectrum	Dependent on number of leads	Central host	Integrated solution	Internal database	No	No	Optional	No	MCBA's order entry/accounts receivable software	Optional training at customer site, phone support	Available on request
LSW, Inc. (301) 459-3383	Cats 2.1	Customer database and purchase history files, activity planner, mail merge, reporting, scheduling, problem tracking, territory/account management, lead tracking, call reports, tickler file, automated correspondence	Intel 80386-based machines, PC LAN, IBM AS/400, any Unix-based minicomputer	8M/30M, 300M hard disk recommended	Stand-alone, central host, LAN	Shrink-wrapped	None	Optional	Optional	Optional	Optional	Word processing, spreadsheets, graphics, report writer	Training at customer site, phone support, eight-hour, five-day hot line, consulting	$2,500/ $16,000 (8 users)

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	FEATURES	HARDWARE PLATFORM	MEMORY/DISK REQUIREMENTS	MODE OF OPERATION	CONFIGURATION	DATABASE INTERFACED WITH	INTEGRATED E-MAIL	INTEGRATED FAX BOARD	REPORT WRITER	CUSTOM GRAPHICS FOR PRESENTATIONS	APPLICATIONS INTEGRATED WITH	SERVICES	PRICE (SINGLE USER/MULTIUSER)
Market Power, Inc. (510) 865-8900 (800) 448-1337	Mastic Information Technology Version 1.40	Customer database and purchase history files, activity planner, mail merge, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing	Intel 80286-based PCs and higher	1M/20M, hard disk required	Stand-alone, LAN, modem for remote communications	Base package plus custom features	Btrieve	Optional	No	Yes	No	Spreadsheets, graphics, other DOS-based packages	Training at customer site, phone support	$5,000 plus $1,000 per user
Marketing Information Systems, Inc. (708) 491-3885	MIS4 4.0 with optional remote	Customer database and purchase history files, activity planner, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, client relationship management system	IBM PCs and compatibles, AS/400, System/36, System/38	512K/1M (to load), 20M hard disk recommended	Central host, remote version integrates with host	Custom	Proprietary	No	No	Yes	No	Word processing	Training at customer site, phone support, consulting	$950 + (laptop version)/$15,000 (5 users), volume discounts available
Micromage Systems, Inc. (410) 363-4452	Account Manager	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, problem tracking, territory/account management, optional order entry	IBM PCs and compatibles	640K/10M, hard disk required	Stand-alone, central host, LAN	Modular, custom	Paspro 2.0	Yes	Yes	Yes	Optional	Word processing, spreadsheets, graphics	Training at customer site, phone support	Laptop ($480), headquarters ($1,995)/ $4,995 (unlimited users)
Mediatech Systems, Inc. (604) 736-0666	Sales Force Automation System	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, territory/account management, order entry/invoice status, E-mail, sales history reports and graphs, call reporting and planning	IBM PC AT and higher	640K/20M - 100M, hard disk required	File server, remote standalone access information via modem	Modular, custom	Informix C-ISAM required	Optional	No	Yes	Yes	Word processing, spreadsheets, graphics	Training at customer site, phone support, implementation support	NA/$1 000 per user
National Management Systems (703) 687-9797	Sales Manager's Workstation	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing	IBM PCs and compatible	640K/HK, hard disk required	Stand-alone, LAN	Custom	None	No	No	Yes	No	Word processing, spreadsheets, graphics and DOS applications	Training at customer site, phone support	NA/$35,000 - $60,000 for site license
Profit Management Systems, Inc. (513) 578-0199	Outcome 7.23	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, lone management, secures distributed data	DEC VAX, HP 3000, IBM PC, Apple Macintosh (optional)	400K (PC only)/10M, 40M hard disk recommended (PC only)	Stand-alone, central host on-line or distributed	Modular, custom	C-Tree	No	No	Yes	Yes	Import/Export merge files will work with any word processor	Training at customer site, $ to 6 phone support, on-site installation, continued enhancements	Available on request
Realworld Corp. (603) 224-2260 (800) 678-8334	Sales Management Software Version 6.0	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, lead tracking, statistical management reports	IBM PCs and compatibles	2M/10M, hard disk required	Stand-alone, LAN	Modular, custom	None	No	No	Yes	No	Realworld Accounting System	Authorized training centers nationwide	$695 plus $195 for System Manager/ $1,295 plus $695 (4 users)
Richmond Technologies & Software, Inc. (804) 299-3121	Maximizer Version 2.1 with Maximerge	Customer database and purchase history files, activity planner, mail merge, quoting, reporting, scheduling, problem tracking, territory/account management, financial calculator, different language versions	IBM PCs and compatibles	512K/2M, hard disk required	Stand-alone, LAN	Modular	Btrieve	No	No	No	No	Word processing	Training at customer site, phone support	$395/$895 (unlimited users)
Salesnetwor Corp. (603) 893-3422	Salesnetwor 3.4.1	Customer database, activity planner, mail merge, forecasting, quoting, reporting, scheduling, territory/account management, lead management, telemarketing	All Oracle supported platforms	Dependent on number of users	Stand-alone, central host, LAN	Modular	Oracle required	Optional	Optional	Yes	No	Word processing, spreadsheets, graphics	Training at customer site, phone support	$995/$5,000 - $50,000 (depending on number of users)
Sales & Marketing Systems, Inc. (800) 832-0030	SalesCTRL2	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, up to 91 fields for contact information, direct mail capabilities, automated upload/download of contact data	IBM PCs and compatibles	384K/2M - 5M, hard disk required	Stand-alone LAN	Modular	Proprietary	Yes	No	Yes	No	Word processing, spreadsheets	Training at customer site, phone support, monthly courses off site, on-site installation and customizing services available	$795/$3,195 (5 users) $4,495 (unlimited users)
Salestlink Technologies (708) 566-0400	Salesfish for Windows	Customer database and purchase history files, activity planner, mail merge, forecasting, optional quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, call reporting management	Intel 80286-based, 80386-based PCs and compatibles	1M/20M (minimum), hard disk required	Stand-alone, LAN	Modular, custom	Host database independent	Optional	Optional	Yes	Optional	Word processing, spreadsheets, graphics, all Windows 3.0 applications	Training at customer site, phone support, 24-hour, seven-day hot line, consulting and systems design services	$795 (bundled with Windows 3.0 and IBM Current 1.1, Windows Productivity Pack)/site license available
Salespro International (615) 371-6187	Sales Producer	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, correspondence, sales management reporting	IBM PCs and compatibles, LANs, Xenix, Unix, AIX VAX/VMS	640K/3M, hard disk required	Stand-alone, central host, LAN	Modular, custom	Dataflex	No	Optional	Yes	No	Word processing, any that will accept ASCII text	Training at customer site, phone support, customized training services, video training	$495 - $695/ $2,200 (5 users on LAN), $2,975 (5 users on Unix)
Sales Technologies (404) 841-4000	Sales Force Automation System	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing	Any DOS-based machine	1M/20M, hard disk recommended	WAN	Modular, custom	RDB, Informix, Oracle, Ingres	Yes	Yes	Yes	Yes	Word processing, spreadsheets, graphics	Training at customer site, phone support, 24-hour, seven-day hot line, hardware support and replacement	Typically $5,000 - $8,000 per user (including laptop)
Salmon Systems (206) 637-7070	Sales Management System Version 3.0	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing, call reporting management	IBM PCs and compatibles	410K/10M, hard disk required	Stand-alone, LAN	Modular, custom	Clipper	Yes	No	Optional	Optional	Word processing	Training at customer site, phone support	$3 000 + (single user)/$5,000 (5 users)
SBT Corp. (415) 331-0900	SBT Corporate Contact Manager Version 6.35	Customer database and purchase history files, mail merge reporting, order entry when linked to SBT sales orders, keeps detailed records of incoming/outgoing calls, generates user-defined lists	IBM PCs and compatibles	640K/20M (for one to three modules), hard disk required	Stand-alone, LAN	Modular	Paradox + Version 2.1, Paspro Version 1.02	No	Optional	Optional	No	SBT database accounting library	Training at customer site, phone support (provided by reseller), bulletin board system	NA/$1,395 (limited only by network)
Scherrer Resources, Inc. (215) 636-1830	Sales Ally Version 3 10	Customer database and purchase history files, activity planner, mail merge forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, order entry, customer billing	All DOS-based machines	380K/2M, 20M hard disk recommended	Stand-alone LAN	Modular	None	No	No	Yes	No	Word processing	Training at customer site, phone support, 24-hour, seven-day hot line (for a fee)	$395/$1,895 (unlimited users)
Scott Computing Systems (404) 433-7000 (800) 241-7576	Scott Customer Manager	Customer database and purchase history files, mail merge, forecasting, reporting, territory/account management, lead tracking	IBM PCs and compatibles, PS/2	640K/10M, hard disk required	Stand-alone, LAN	Modular	None	No	No	Yes	No	Word processing, spreadsheets	Training at customer site, phone support, update service	$995/$2,995 (30 users)
Select Marketing, Inc. (512) 345-1345	Marketing Management System Version 3.2	Customer database and purchase history files, mail merge forecasting, reporting, scheduling, territory/account management, sales forecasting, return on investment reports	IBM PCs and compatibles, Unix Platforms	512K/1M, hard disk required	Stand-alone central host LAN	Modular	None	No	No	Yes	Yes	Word processing, spreadsheets, graphics, database	Training at customer site, phone support	$149/$995 - $1,995 (unlimited users)
Snap Software, Inc. (603) 623-8877	Snap Version 4.0	Customer database and purchase history files, activity planner, mail merge, forecasting, quoting, reporting, scheduling, problem tracking, territory/account management, distributed database capability, lead tracking, lead fulfillment, customer service	IBM PCs and compatibles, PS/2, laptop and portables	640K/2M - 4M, hard disk required	Stand-alone, LAN, WAN	Modular, user-defined configurations	Btrieve	Optional	Optional	Yes	No	Word processing, spreadsheets, E-mail	Phone support, regional training seminars, Snap 900 phone number	$1,200 per concurrent user, $2,000 minimum, volume purchase plan available

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Software of the Future, Inc. (214) 964-9500 (800) 765-7385	Sale Maker Plus Personal Version 3.0, Professional Version 4.0	Customer database and purchase history files, mail merge, forecasting, quoting, reporting, product tracking, territory/account management, order entry, authorization, to-do lists, telemarketing, direct marketing	IBM PCs and compatibles, PS/2, LANs	640K/20MB, hard disk recommended	Stand-alone, central host, LAN	Integrated software with modules	Internal database	No	Optional	Yes	No	Word processing, spreadsheets	Training at customer site, phone support, hot line, annual service contracts	$395 (Version 3.0), $695 (Version 4.0)/$1,495 (Version 3.0, 5 users), $2,495 (Version 4.0, 5 users) plus $995 per each additional 5 users
Softworks, Inc. (301) 869-4321	Market 4.2	Customer database, activity planner, mail merge, forecasting, reporting, territory/account management, tracks advertising effectiveness	IBM PCs and compatibles	192K/1M, hard disk recommended	Stand-alone, LAN	Shrink-wrapped	None	No	No	No	No	Word processing	Phone support	$349/$1,500 (5 users)
Target Management, Inc. (800) 765-8778	Effector Version 3.0	Customer database and purchase history files, activity planner, mail merge, forecasting, reporting, scheduling, territory/account management, prospect tracking, call scheduling, telemarketing, database management	IBM PC/XT, Intel 80386, Zenith-based machines and compatibles	640K/20MB, hard disk required	Stand-alone, LAN, distributed system	Modular	None	Optional	Optional	Yes	No	Word processing	Training at customer site, free phone support	$495/$1,495 (unlimited users)

Why remodeling often beats building

BY ALAN J. RYAN

Most companies that tried and failed in the early 1980s to grow their own sales force automation systems have begun moving to packaged wares.

Some claimed success with the "build your own" approach, but many others found themselves entrenched in systems that were not always user-friendly, difficult to modify as needs changed and sometimes ignored by users.

> THE TEMPTATION TO build your own can be strong. There is rarely a perfect fit between a client's needs and a commercial package.
>
> KEVIN CARSON
> SALES AUTOMATION

Meeting the needs of many departments was the problem with 3M Co.'s homegrown attempt. The firm tried installing mainframe terminals at the homes of sales representatives to give them access to corporate mainframes via telephone lines. In 1987, 3M replaced the system with a package from Sales Technologies running on laptops from Toshiba America, Inc. and Compaq Computer Corp.

Each 3M division has a different system, says Joan Bircher, manager of sales support systems. "Even though they are using the Sales Technologies software, each division decides which modules best fit their business, how they want the modules to look and the information they want to collect and distribute through the system."

The temptation to build your own can be strong. There is rarely a perfect fit between a client's needs and a commercial package, says Kevin Carson, president of Sales Automation, Inc., a consulting firm in Downingtown, Pa.

Most companies either search for a close fit in commercial products and learn to adjust or shop for products that can be tailored to their needs, analysts and consultants say.

At Sales Automation, clients can discuss which desired functions can be discarded and the consequences of using software that won't meet particular needs.

At Allstate Insurance Co. in Northbrook, Ill., the answer was somewhere in between.

Allstate developed a hybrid system by linking the functionalities of four off-the-shelf sales force automation packages in 1985. That system served as a prototype for the design of a proprietary system currently in place for more than 15,000 users, says Fred Allegretti, assistant vice president of sales distribution technology in the agent education and development area.

Still, Allegretti says, improving the sales system product is an ongoing effort.

"From our prototype, we were able to put together a system very quickly," he says, but the system is continually modified. In the first year, there were as many modifications to the system as there were days, Allegretti says.

Time frame alone can push a company toward packaged software. Gil E. Cargill, president and founder of The IDK Group in Culver City, Calif., says it takes two or three months to get salespeople up and running with off-the-shelf packages vs. one to two years for custom-built applications.

While typical companies show productivity gains of anywhere from 10% to 34% by using any sales force automation tool, "if you build your own and get another 2% to 3%, it doesn't offset the cost of building the system," Cargill says. ●

Software that knows the business

You may be able to find software that already sells it your way. Some companies purchase packages already tailored for their vertical market. General-purpose software is more prevalent, but some vendors have spotted industries or companies large enough to justify writing and then selling specialized software.

This software does not entirely eliminate customization. However, vertical industry packages do include required features and are written in the industry's jargon. This tends to set at ease salespeople threatened by computerization, says Leon A. Wortman, chief executive officer at Success Analysis Corp. in Palo Alto, Calif.

For instance, Philadelphia-based Sherrer Resources, Inc.'s Realty Ally offers real estate-specific features.

According to Coldwell Banker Real Estate Group, Inc. real estate agent Don Horne, who has whittled his work time by at least four hours and upped his productivity by 30%, this specialized software has its rewards.

Horne has used Realty Ally in his Cherry Hill, N.J.-based office since February 1990. The $395 package runs on a Compaq Computer Corp. LTE laptop that cost $4,700. Because he was able to take on paperwork formerly handled by a part-time secretary, Horne's investment paid for itself in only six months.

In the packaged goods industry, vendors such as Envoy Systems Corp., located in Waltham, Mass., include modules that specifically treat chain stores.

Fastech, Inc. in Broomall, Pa., also targets the packaged goods market. Its IBM mainframe or Digital Equipment Corp. VAX-based system targets direct sales manufacturers, broker sales manufacturers and retailers, and modules include Retail Conditions, Order Management and Report Distribution.

Atlanta-based Sales Technologies offers Package Goods, which helps gather pricing information on competitors' products for the benefit of sales managers. Sales Technologies also has a package for the pharmaceutical/health care products industry.

In the petroleum industry, Envoy offers Lubricant Sales, which takes into consideration the rapid fluctuation of fuel prices. The product includes a special price agreement function that enables field salespeople to receive quick approval for prices customers have accepted.

Another advantage of specialized software is training, a service that is usually part of the package. These vendors claim they are better at motivating field salespeople because they are familiar with industry practices.

Another approach to meeting special needs is through templates. High Caliber Systems, Inc. in New York provides specialized templates for various industries with its Peoplebase software. The company targets wholesalers, real estate agents, stockbrokers, bankers, fund-raisers and advertising salespeople. A single-laptop version costs $199, and a networked personal computer version is priced at $699.

MEL MANDELL

GTE, Contel get it together

With merger finalized, GTE's task is to consolidate and integrate data centers

BY JOSEPH MAGLITTA

On Thursday, Feb. 28, a crated IBM 3090-600 was wheeled onto an 18-wheeler at Contel Corp.'a headquarters in Atlanta. A few moments later, the mainframe was rumbling south to a GTE Corp. data center outside Tampa, Fla.

So began the first major move in an effort to merge the information systems operations of GTE, the Stamford, Conn.-based telecommunications and lighting giant, with Contel.

Finalized on March 14 after nine months of talks, the $6.6 billion merger created the nation's largest local telephone company — serving 40 states with 18.6 million lines. With 50 million potential customers, the combined firm now ranks as the nation's second largest cellular phone company.

The pact also gave IS departments at both companies the green light to begin in earnest the complex work of translating paper partnership into a computing reality built on hardware, software and networks.

On the surface, the plan is simple. "As the telephone operations of the two companies merge, Contel users will migrate to GTE systems and be processed there," explains William R. Wofford, vice president of operations services at GTE Data Services, Inc., GTE's data processing subsidiary.

However, it will take the next two years to handle the myriad details involved in integrating GTE's mostly IBM-based MVS systems with Contel's minicomputer and Honeywell, Inc. operations.

Maglitta is a *Computerworld* senior editor, executive report and integration strategies.

When the first phase is completed at the end of this month, hardware and various customer service applications at Contel's Atlanta data center will have been shifted to GTE information processing centers in Temple Terrace, Fla., and Fort Wayne, Ind. Other hardware cabinets will be shipped out in July.

The second phase will consist of a state-by-state migration of other Contel applications, such as billing, toll, service orders and operational applications, to GTE data centers during the next 24 months. Contel facilities in Winsville, Mo., Bakersfield, Calif., and Chantilly, Va., will be combined with GTE centers and then closed by early 1993.

While the costs are still being calculated, company officials said they expect savings from the Contel consolidations to reach $40 million.

Skip Comby

GTE's Wofford: *Contel users to be processed on GTE systems*

Integration efforts

The task of handling the Contel integration will fall to GTE Data Services, the 4,200-person data processing, telecommunications and service arm of the company's telephone operations.

Based in a $30 million software development facility located in Temple Terrace, GTE Data Services serves operations in the U.S., Canada and Dominican Republic. With 1990 revenue of $480 million, the unit ranked as the third largest information management company in the nation.

GTE Data Services is well versed in the nuances of consolidations: The GTE/Contel project comes hot on the heels of a four-year GTE effort to combine and integrate nine of its regional data centers into four (see story below).

"We thought that we might rest for a while" between projects, laughs Ralph E. LeMeur, director of GTE's information processing center in Sacramento, Calif., and a key member of the consolidation team for both projects. "But I think we're learning that the business is moving so fast that we don't have any time to rest anymore."

Ironically, Contel was in the middle of its own consolidations when the GTE merger was finalized. "Some of the project team members were frustrated" at not being able to finish the work, says Ron Kindland, vice

Continued on page 76

GTE to save $149 million

Source: GTE Data Services, Inc. CW Chart: Doreen St. John

BY JOSEPH MAGLITTA

How much money would it take to convince you to shut down half your data centers, truck and fly the hardware plus tens of thousands of tapes across hundreds of miles in snowstorms and fog and set up again in a new location — doing it all over two years' worth of weekends and without disrupting user service?

How does $149 million sound?

That's how much GTE Corp. expects to save in labor and overhead costs by 1992 as a result of consolidating and integrating nine regional data centers into four.

Now entering its final weeks, the four-year project by Stamford, Conn.-based GTE is finishing four months ahead of schedule and below budget. Moreover, company officials say, projected savings are $18 million more than was originally expected.

"The project has been very, very successful," says William R. Wofford, vice president of operations services at GTE Data Services, Inc., which coordinated the consolidation efforts with GTE networking, field service and facilities groups.

The big challenge for GTE now, says Dennis Saputo, a senior analyst at Moody's Investors Service, Inc. in New York, will be to find new ways of keeping the savings. Federal regulations limit the amount of profit telephone companies can make.

GTE says savings from the project already hit $49 million in 1990, the first full year of the consolidation/integration. The moves will also let the division reduce data

Continued on page 72

Continued from page 71

center head counts by nearly 300, or 25%, by 1992 and eliminate 87,316 sq ft of expensive data center floor space, according to company officials.

Other payoffs include a minimization of duplicated efforts and improved information systems control, Wofford says. "We now can manage four centers as one" because of increased integration, he says.

Success factors

Planning for consolidation and subsequent integration began in early 1987. At that time, GTE management identified data center efficiency and software as key factors in the future success of the company's telephone operations.

Soon after, GTE's board of directors approved a feasibility study, and the company established a planning team. Planners considered 115 options, ranging from maintaining the status quo to combining all nine data centers into one huge "megacenter," says Mac Dunn, director of operation services.

GTE's IS staff *works together at its Durham, N.C., data center*

Eventually, planners settled on four centers because this option lets GTE keep a presence in each region, minimizes the risk of jeopardizing 99.5% uptime and makes the best use of its computing assets.

According to the plan, GTE data centers would be closed in Marina Del Rey, Calif., Raleigh-Durham, N.C., Erie, Pa., Tampa, Fla., and Everett, Wash., and their contents integrated with centers in Temple Terrace, Fla., Sacramento, Calif., San Angelo, Texas, and Fort Wayne, Ind.

Furthermore, the centers in Temple Terrace, Fort Wayne and Sacramento would be more than doubled in size from a total of 156,000 sq ft to 396,000 sq ft to handle the additional equipment. The fourth center in San Angelo would stay at 48,000 sq ft.

"There really weren't any rules to follow about how to do it," says Tom Kaczmarek, Fort Wayne consolidation manager. "We had to create guidelines at every step of the process."

During five weeks in mid-1987, the team devised an implementation plan, financial estimates and preliminary schedules, Kaczmarek says. The biggest challenge was the enormous job of planning, he says.

The plan was approved in late 1987. Core teams were then formed to coordinate consolidation from a national and local perspective. The 12-member teams represented each of the affected data centers, which developed individual approaches for each of their sites. Some opted for a "flash cut," and others for a more gradual transfer.

"We spent months and months creating our 'bible,'" consolidation manager Robert C. Taylor says, referring to the detailed playbook that guided his team's efforts. The book described actions that needed to take place every 15 minutes for the entire 96-hour move.

To keep things organized, data center directors worked with four area consolidation managers. Directors met monthly with Wofford to ensure that individual plans wouldn't conflict with each other and to share ideas.

The first consolidation work began in Erie in July 1988. More followed, continuing through November 1989 (see story page 74). Integration efforts have continued throughout the project and are scheduled to conclude on May 12 in Sacramento.

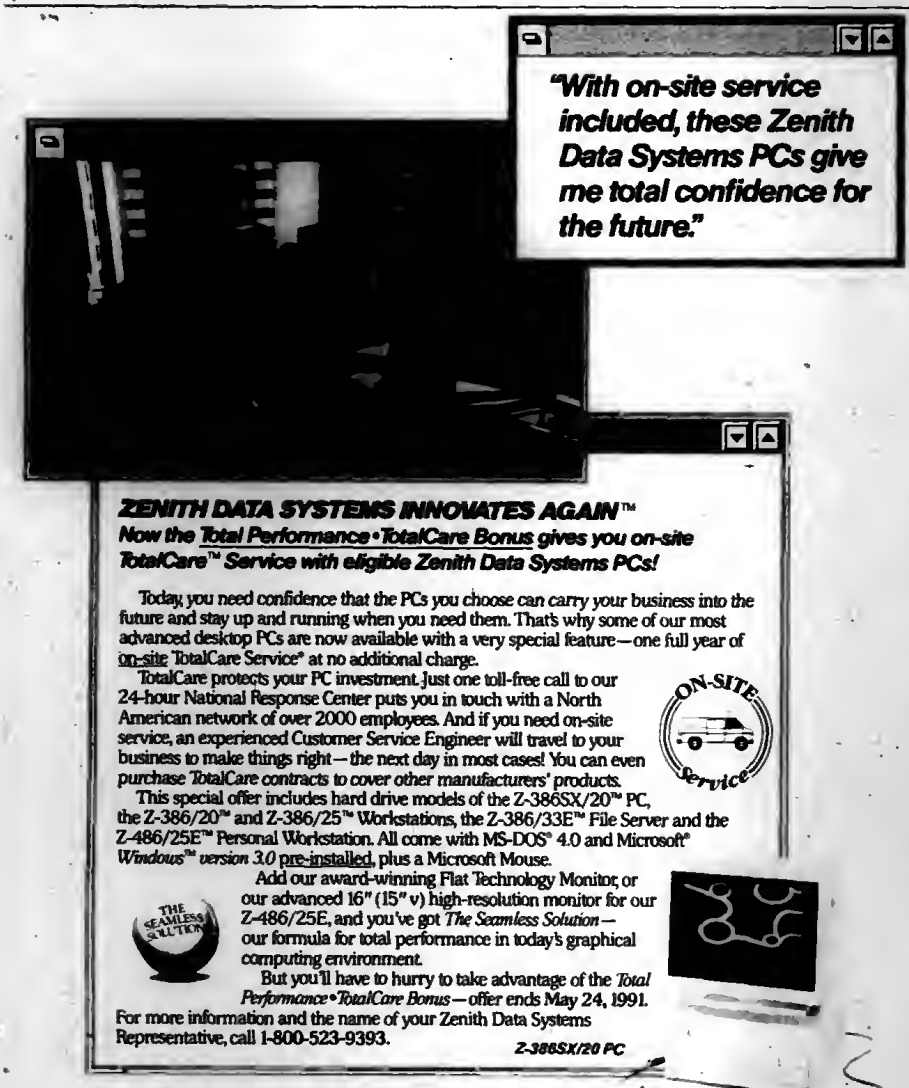
The price tag for the GTE consolidation/integration effort was $61 million. Roughly two-thirds of that amount was for enlarging existing centers; the other third was for the move. But GTE planners say the hefty cost will be more than offset in the first two full years of the consolidation.

Besides helping GTE trim costs and standardize, the project has also paved the way for a smooth computer merger with Contel Corp., which the company acquired in March (see story page 71).

'War stories'

Each of the moves produced its own "war stories," which have become part of company lore.

For example, during the move from Erie, "the plane landed at 3 a.m. with consolidation data, and the charter service area was closed," Kaczmarek recalls. "[The area] was located far from the main terminal, so staff handed boxes over a 7-ft-high security fence to crew on the



other side." The consolidators then climbed a radio antenna and jumped the fence themselves.

There's also the story about how a rare snowstorm hit Durham in February 1989 while tapes were being loaded for shipment to Temple Terrace. After towing a stuck truck, GTE Data Services staff members raced to a chartered corporate airplane that was in a hangar to be de-iced in preparation for the flight. The plane was the last to leave before Raleigh-Durham Airport was closed for two days because of 18 inches of snow.

Some staff members participating in the largest move — from downtown Tampa to Temple Terrace — worked for 70 straight hours.

Network traffic

The consolidations greatly increased networking traffic because they required more data transfers between the various locations, GTE's backbone network manager Gary Wiest explains. "Availability is a major issue," he says, "because with only four [data centers], we've got a lot of eggs in one basket."

To build in safety, the T1 backbone network was built with lines from AT&T, MCI Communications Corp. and U.S. Sprint Communications Co. feeding into each location to provide backups in case of line failure, Wiest says. Consolidation teams did most of the work, supported by the networking group.

Each center was in turn served by three networks: an IBM Systems Network Architecture network to handle interactive traffic, a channel extension network for large print volumes and an X.25 network to serve minicomputer operations. The majority of this work was done in 1988, before the consolidation began.

With physical consolidation completed, the teams began integrating the equipment at each site. Work done at the Sacramento center is a good example of the complex nature of the postconsolidation tasks.

Maximum flexibility

After examining CPU images from Everett and Marina Del Rey, the Sacramento team established an architecture that maximized availability and flexibility, says Ralph E. LeMeur, director of GTE's information processing center in Sacramento. Work loads for billing, trouble administration and other functions were moved around and consolidated to one console spanning an Amdahl Corp. 1400 and two IBM 3090 Model 600 systems.

Time-consuming details

Beginning in June 1990, three Sacramento center staff members devoted between 40% and 50% of their time handling the time-consuming, nonprogramming details that comprise integration, including wiring and cabling CPUs, merging catalogs and tape library systems and writing minor utility programs. Much of the work is tedious.

"A programmer up in Everett may name a data set XYZ. A programmer in Marina Del Rey may name another data set XYZ. There you have a problem because you can't merge catalogs as long as you have duplicate data set names," LeMeur explains.

Despite the myriad details, GTE Data Services officials say there's no doubt the headaches are worth the trouble.

Wofford says that from the start of consolidation until now, total IS costs have gone up less than 5%, while the work load has increased 38%. "In previous times, [IS costs] were running 10% to 12% a year," Wofford explains, chalking up the benefits to more efficient operations.

During the same period, he adds, cost per billable CPU unit fell 43% in 1989 and 51% in 1990 to $117 and $83, respectively. "That's the most significant drop we've had in some time," Wofford adds.

The savings frees up money for future data center automation, which will in turn produce more savings, he says. In fact, the project has been so successful that IBM and Texas Instruments, Inc. have visited to take a closer look.

Probably the biggest problem now, Wofford says, is figuring out what to do with the vacated data centers in Erie and Marina Del Rey. "It's not inexpensive to walk away from a building," he says, noting that air-conditioning, heating, security and other costs add up.

GTE would like to sell the empty buildings and is exploring the possibility of making the structures more attractive to the market by converting them to general-purpose use. •

Master plan

- **The plan:** Consolidate and integrate nine GTE regional data centers into four to reduce operating costs and position company for future growth.
- **Schedule:** Initial planning, 1987; consolidations from February 1988 to November 1989; integration from early 1988 to May 1991.
- **Cost:** Approximately $61 million. Two-thirds for enlarging existing centers; one-third for actual moves.
- **Benefits:** Savings of $149 million in labor and overhead by 1992; data center head count reduced by 25%, or about 300 people; 87,316 square feet of data center space eliminated; duplicate efforts minimized; overall control of operations improved; cost per billable CPU unit down 51% in 1990.

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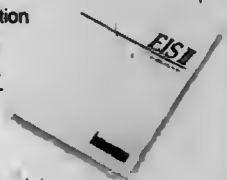

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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use"

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Moving experience: Capsule summaries of GTE's efforts

BY JOSEPH MAGLITTA

Erie, Pa., to Temple Terrace, Fla., and Fort Wayne, Ind., July 1988 to August 1989:
GTE Corp.'s kickoff consolidation project began in July 1988 with the company's largest production on-line systems, which resided in Erie.

The firm moved the first systems to the Tampa Technology Center in Temple Terrace over the July 4 weekend. Consolidation planners had decided to do gradual cutover to Temple Terrace and Fort Wayne to avoid disrupting customer service, consolidation manager Robert C. Taylor says. The idea, he explains, was to set up fully functional systems in the new center prior to the physical moves. Then key operating data could be quickly moved and dropped onto the new system.

Taylor describes the process this way: "We shut the on-line systems down at midnight. Then we dumped the databases onto 400 or so tapes, crated them up at the data center and drove them to the airport at Erie and onto the chartered plane for Tampa airport."

After a two-hour flight arriving at 3:30 or 4:30 a.m., the volumes were rushed to the data center and loaded onto waiting IBM 3090-600s. "We then started loading the databases, and at 5 or 6 in the morning, we were running live. When the user came in at 6 and logged on, he didn't see any specific change," Taylor says.

The firm relocated other production systems to Temple Terrace on Labor Day 1988. The rest of Erie's applications were moved one by one to Fort Wayne between October 1988 and August 1989. "All the networks and terminals were pretested," Taylor says. "You just throw the switch, and that's it — a very simple move."

Durham, N.C., to Temple Terrace, May 1988 to February 1989:
The movement of GTE's Southern region billing, payroll and other batch and some on-line systems from Durham to Temple Terrace took place between Labor Day 1988 and Feb. 16, 1989.

Using a similar approach to the one used in Erie, the team set up a "mirror image" IBM 3084 system and storage devices in Temple Terrace, consolidation manager Thomas Kessling says.

Two moving vans and a chartered jet carried the 60,000 data tapes and 400 application and systems dump tapes the 600 miles to Temple Terrace.

To avoid the extra labor of boxing the 20,000 to 30,000 cassette tapes, team members wrapped Saran Wrap around the tape storage racks, which were loaded onto a climate-controlled truck and driven away.

Both trucks were loaded only half full so that if one vehicle broke down, cargo could be quickly loaded onto the other truck. As an extra precaution, a mechanic rode with the trucks, which stayed in contact with headquarters via a cellular telephone. Employees with cellular phones also monitored vans carrying equipment to Temple Terrace from Durham at checkpoints along the route.

Skip Gandy

GTE's Taylor: *"You just throw the switch — a very simple move."*

Staff prelabeled all cartons to help truck drivers place equipment in the right spot. "When the truck driver wheels the carton onto the floor, the label and mark on the floor says A-1-5, and he puts the rack right there," Kessling says. "That way, he doesn't have to move it again."

The first batch systems, residing on an IBM 3083, were moved in September 1988. Production on-line systems and test systems followed. Testing began in October 1988, and the last data was transferred in August 1989.

Despite a rare snowstorm, the 60-hour move went flawlessly, Kessling says. "We unloaded both trucks, put everything on the floor, and we were rock and rolling. We got calls from customers who were sure we had called it off. They didn't even know we had moved."

Marina Del Rey, Calif., and Everett, Wash., to Sacramento, Calif., May 1989 to May 1990:
Because of the size and number of customers, these moves were the most difficult to date. Work began over Labor Day weekend in 1989 and took most of 1990. A 40,000-tape library was shipped from Everett to Sacramento on Veteran's Day 1989.

To avoid getting stuck in the notorious Sacramento fog, planners found two alternate locations into which airplanes could fly, consolidation manager Matt Mesplou says. In addition, the first two floors of the Sacramento center had to be reconfigured for incoming tapes and equipment.

Downtown Tampa to Temple Terrace, February to November 1989:
The 18-mile move from a GTE office tower in downtown Tampa to suburban Temple Terrace over a Thanksgiving holiday was the most complex.

Because the data was heavily meshed between systems, planners decided a flash cut would be the only way to avoid missing any disk sets.

Between February and November 1989, two full-time information systems staff members and two others spent a total of 12,000 hours planning the move.

In the weeks preceding the physical moves, the team conducted several dry runs and simulations. Dummy on-line systems were set up and network switches were rerouted. Then staffs brought in end users to make sure they could easily access their data and applications.

GTE hired IBM field service staff members to do the moving of hardware and peripherals from the 11-story tower.

Some 300,000 magnetic tapes and cassettes were packed, along with 450 pieces of hardware, including 100 tape drives and "several hundred" boxes of IBM 3380 direct-access storage devices.

IBM, Memorex Corp., Storage Technology Corp. and Bull HN Information Systems, Inc. each moved its own systems.

To coordinate the project, the company established a 24-hour message and control center. GTE also set up a telephone hot line, giving end-user callers a three-minute project update every hour.

Team leaders worked for 70 hours straight, catching catnaps in a motor home driven into the parking lot.

"The on-line systems came up Thanksgiving morning" on a new IBM 3080-600S already in place, Taylor recalls. "We went home and had turkey that following Sunday." •

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Continued from page 71

president of information services for Contel's telephone operations.

Nonetheless, Contel IS staffers, led by Kindland, dug in and played a major role in consolidation planning with GTE.

Both the data center consolidation and the Contel merger come amid massive corporate cost-cutting and restructuring at GTE. The firm is now in the fourth year of a five-year program to shave $1 billion from annual overhead, partly by shedding 14,000 employees.

By and large, those cost-containment efforts have been successful, according to Dennis Saputo, a senior telecommunications analyst at Moody's Investors Service, Inc. in New York.

Now, GTE will have to speed up the actual work of merging with Contel while "pausing to digest," he says.

October brainstorm

Groundwork for the Contel consolidation actually started months before the merger was finalized. Beginning last October, teams from GTE and Contel began meeting to discuss plans in anticipation of final approval. In November, four staffers from each company met to firm up details. Drafting a final plan "didn't take that long," says Wofford, a 35-year company veteran. "But we had to go through different what-if scenarios and take those into management to see what they thought. So it kept changing."

Initially, the plan called for slowly integrating systems by the end of 1994. The idea was to save money by "forklifting everything to one location," closing the Contel sites immediately and gradually integrating from there, Wofford explains.

However, GTE's systems people devised a faster, "much better" plan to integrate all systems by 1992, Wofford says. Planners decided that, except for the IBM 3090 trucked from Atlanta, the Contel computers would be left in their original locations during migration until GTE decided what to do with them.

GTE Data Services officials are confident that lessons learned from their recent consolidations will serve them well in the Contel project. "It's almost like we did this last year, and I think we have a very good plan," Wofford says, calling the initial planning "duck soup."

No one is suggesting that the effort will be a total romp, however. For one thing, Contel centers won't simply be moved to the nearest GTE center. Instead, applications such as customer billing and service will go where they make the most sense, regardless of location. Some of the work now done at Contel's Dulles Airport center in suburban Virginia, for instance, will go to Fort Wayne, and the rest will go to Temple Terrace.

Another sticky wicket will be Contel's use of Honeywell, Inc. systems. At the time of the merger, Contel was moving toward IBM-based enterprise systems. However, most of the company's applications still run on various Honeywell DPS8 and DPS90 series systems and are different from GTE's.

Besides being more complex, the IBM/Honeywell migration will require many man-hours to make any necessary changes. Company officials estimate that it will take until June 1992 to write all the conversion systems needed.

On the networking side, GTE plans to move Contel's network control center out of Atlanta by the end of 1991. Then, as individual states are converted, Contel's IBM-based network will be integrated.

Dwindling data centers

IS staff members, however, won't have much time to rest on their laurels; the Contel consolidations may not be the last for GTE. Thanks to a continued move to a distributed architecture, GTE officials predict the number of data centers will continue to dwindle into the next century despite sharply increasing work loads.

"By the year 2000, we project that we will probably have three centers, though it could go down to two," Wofford says. "We see a substantial reduction in mainframe MIPS all through the 1990s."

Besides cutting costs and improving efficiency, GTE also looks on the data center consolidations and integration as the foundation for future growth.

For instance, the integrated environment has already made possible such ambitious projects as GTE's new, handheld computer-based automated work administration system as well as a Storage Technology Corp. automated tape library system.

Maria Monnes, a senior associate at Pyramid Research, Inc. in Cambridge, Mass., says Contel is aggressively pursuing expansion in Europe and Latin America. Cost-cutting and automation efforts will benefit its position against the regional Bell operating companies and other competitors, she says.

For now, however, team members are focusing on the work at hand. "We're eager to be getting on with it so that we can gain some of the synergism that the merger is all about," LeMeur says. •

Tips for blending data centers

Thinking about consolidating and integrating your data centers? Keep in mind the two Ps — people and planning — experienced consolidators at GTE advise.

The following are tips for consolidation success:

• **Keep everyone informed.** The most important thing, GTE consolidators agree, is to keep all those involved well-informed. "People are much more understanding and much more willing to be team players if they know that management is telling them everything they know," says Ralph E. LeMeur, a veteran information center director who played a key role in the two recent GTE consolidations.

The company practices what it preaches. For the GTE/Contel consolidation, the companies developed a newsletter, and in late March, thousands of employees got a thick packet of information detailing the merger. Top company executives meet regularly with employees to discuss the issue.

• **Involve users and suppliers.** Good communications extends to end users and vendors as well, says consolidation manager Robert C. Taylor. "You have to involve the customer," he says. "Let them know what's going on. Get buy-in by showing them [how] the process works." As for vendors, they attended all consolidation meetings.

• **Give plenty of notice.** It's important to give as much notice as possible of what is going to happen, which helps reduce anxiety. For example, workers affected by recent consolidations knew two years in advance. "You've got a lot of people out there wondering what's going to happen to them and their lives," LeMeur says. "I think we owe it to them" to keep them informed.

• **Work with human resources.** During GTE's last consolidation, IS staff members worked closely with GTE's human resources department to help affected employees. Human resources representatives met individually with every person affected by the moves and discussed career plans, options and relocation benefits.

Outplacement, counseling and, when necessary, letters of introduction to other employers were provided. Displaced workers were offered retention bonuses to induce them to stay on the job for as long as they were needed. In addition, periodic bulletins and articles in internal publications offered updates on progress.

GTE considers its approach successful: In the recent consolidation, 243 employees relocated, 49 took early retirement, 34 were reassigned, 40 transferred and 141 were laid off.

Currently, GTE and Contel are working together "to make sure we provide jobs to anybody who wants them," LeMeur says. Contel workers will be given preferential treatment in filling vacancies.

• **Have a structured plan.** The best informed and motivated employees are wasted unless used wisely, GTE consolidators warn. Thus, good, structured planning is key, they say.

"Write down even the obvious, then go through and make sure that even the obvious works. Do dry runs to ensure that every detail is taken care of," LeMeur says. "You don't want anything to happen by accident."

Part of good planning, Taylor says, is doing as much up-front work as possible.

"Preinstall everything you can to make up for short windows," he advises. "Get your DASD in place, and set up an on-line operating system. Get all the network in place and test it, and make sure users can access it. Then, all you have to do on zero day is to lower live data onto existing DASDs."

Taylor also recommends pretesting everything and letting vendors prepare the data center.

In this way, IS staff members can concentrate on supervising.

JOSEPH MAGLITTA

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Sometimes the twain meet

▶ In 1987, Torrance, Calif.-based database maker **Ashton-Tate Corp.** made s 20% investment in Bedford, Mass.-based **Interbase Software Corp.** Two years later, it upped its stake to 51%. Late last month, Ashton-Tate acquired the remaining 49% of Interbase, and Interbase, which will operate as an independent, wholly owned subsidiary, acquired s new president: industry veteran **Paul Bergeron**, most recently international sales director at **Stratus Computer, Inc.** Bergeron replaces Interbase founder James Starkey, who said he is headed back down the entrepreneurial road.

Sign of the times . . .

▶ The **Digital Dealers Association**, s 9-year-old trade association of firms doing business in used **Digital Equipment Corp.** computers, hired s DEC veteran technologist as the first executive director in the association's history.

Prime Computer, Inc. hired s veteran financial manager to establish and man an internal audit function in the firm.

Software and services trade association **Adapso** voiced concern over its finding that minority-owned enterprises are being slighted in the Kuwait reconstruction effort and called on all "involved in the process of soliciting, recommending, obtaining and awarding" contracts and subcontracts for the Kuwait project to keep qualified minority candidates in mind.

Mipro III, s Redwood City, Calif.-based disk drive repair and data recovery firm, is extending its services to Europe and Japan.

Two-timer

▶ **Banyan Systems, Inc.** cofounder Anand Jagannathan is at it again: His latest venture is Sunnyvale, Calif.-based **Reach Software Corp.**, which is positioning itself to tackle electronic mail-enabled work-flow applications for personal computer local-area networks. Starting up with 25 employees, Jagannathan as chief executive officer and private funding — including joint venture capital from HCL America — Reach is promising its maiden products by the end of 1991.

A leaner Control Data ready to play ball

CDC has had an active past few years, realigning business units and reducing its work force

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — The Control Data Corp. that steps up to the plate this baseball season will be a smaller, leaner, more confident player than it has been in years.

It has taken a bruising few years for CDC — a firm once ranked among the top old-guard mainframe computer companies — to rethink its future and exit half a dozen lines of business.

The divestments have been in both profitable units (CDC's Imprimis Technology, Inc. disk drive unit sold to Seagate Technology, Inc. in 1989) and unprofitable ones (its money-losing ETA Systems supercomputer unit folded in 1989). The divestments have shrunk the company from $3.5 billion in revenue in 1985 to $2.9 billion in 1989 and $1.7 billion last year. It has also meant cutting the work force from approximately 10,000 employees two or three years ago to about 4,700 today.

At the same time, CDC has pursued s two-pronged strategy of reorienting toward open systems architecture and finding hardware and software partners who can help it deliver these offerings to the marketplace.

"Worldwide, I don't think there will be more than a handful of general-purpose computer companies," said James E. Ousley, president of the Computer Products Group. "CDC will not be one of them.

"By 1995," Ousley continued, "Control Data will be s company that is very focused on two major markets: manufacturing [specifically automotive and aerospace] and information management for technical and engineering [environments]."

According to Ousley, at least some of CDC's challenges in recent years have reflected the systematic changes in the computer marketplace, in particular the increasing importance of distributed and open systems.

CDC, he reasoned, was hit early by these changes because its traditional markets have been engineering and scientific computing. "If you look at the engineering and scientific segment, those are the ones to try new solutions . . . so the move to open systems began there," Ousley said. In contrast, it takes s payroll group a lot longer to decide to make this transition, he said (see story page 79).

Last hurrah

A banner event for the Computer Products Group — which along with CDC's various business and computer services represents 37% of overall firm revenue — was the 1989 introduction of the Cyber 2000, probably the last hurrah in CDC's proprietary mainframe line. CDC has stated it will continue to support the Cyber line through the end of the decade. In light of this, last year it introduced Empower, an open systems architecture designed to migrate existing Cyber users to a distributed Unix environment.

The company's 1992 business plan calls for revenue from open systems to surpass those from proprietary ones.

Still, analysts only partially accept Ousley's perspective on CDC's past troubles.

Prior to Lawrence Perlman's becoming president and chief executive officer last January, "this company had totally inadequate controls and no sense of mission at the top," said Frederick A. Wise, an analyst at Bear Stearns & Co.

"Would s better managed CDC 10 or 15 years ago he facing these same issues? Undoubtedly," Wise said. "But would they be in better shape now? Undoubtedly."

But Wise, who calls CDC a "turnaround," joined other investment analysts in giving CDC generally favorable reviews. Bear Stearns, for example, estimated that CDC will show earnings of $1 per share this year, up from 74 cents per share last year. Moreover, Wise's preliminary figures project the company earning $1.25 to $1.50 per share from operations in 1992.

One benchmark will be how

Continued on page 79

"BY FOCUSING ON ITS historical strengths . . . [the CDC Computer Products Group] can succeed and grow as a provider of applications and integrated solutions."

Lawrence Perlman
President and CEO
Control Data Corp.

Six strikes, you're . . . in?

Once a major force in the computer industry big leagues, a battered Control Data came up with a new game plan that it hopes will see a leaner, keener firm driving the profits once again:

- During the past three years, CDC has exited some half a dozen businesses — slashing immediate revenue as well as work force count — in order to hone its focus
- By 1995, CDC intends to be concentrating on two markets: manufacturing and technical/engineering information management
- CDC is counting on a team of hardware and software allies to help it score in the open systems arena

Source: Control Data Corp.

CW Chart: Doreen St. John

Troubled firms get short-term executive aid

BY MITCH BETTS
CW STAFF

BETHESDA, Md. — In one more sign of the industry's volatile state, s new business launched last month provides "interim executives" for specific assignments at high-technology companies faced with some sort of crisis.

The crisis may be the sudden departure of a chief financial officer, s merger or acquisition, a turnaround situation, a big contract award or the launch of European operations, said Robert F. Ryan, president of the new firm, Dahl-Morrow International.

The company draws from s pool of nearly 500 senior-level executives, including chief executive officers, CFOs, marketing vice presidents and information systems executives who are eager to take challenging assignments of short duration — usually three to 12 months, Ryan said. Dahl-Morrow's initial clients include Contel Corp. (which recently merged with GTE Corp.) and several defense contractors.

Hiring temporary executives allows companies to solve s critical problem quickly with a seasoned manager suited to the task without having to pay fringe benefits, Ryan said. The executives tend to be financially secure from long and successful business careers, he added, so they are not worried about pension benefits.

Dahl-Morrow's Ryan *helps unemployed executives*

Ryan is s prime example of an interim executive, although he takes an equity position in each company he runs. He was recruited by Dahl-Morrow's investors to organize and manage the company through its start-up phase, a period of up to three years. Then, he said, he will move on to manage another start-up company.

During the past two decades, Ryan has repeatedly done just that. In 1970, he launched Dialcom, Inc., which began as a computer service bureau and evolved into an international electronic messaging firm that is now part of British Telecom. Ryan also launched Source Telecomputing Corp. (recently absorbed by Compuserve, Inc.) and TCOM Services, Inc.

Western Digital sells off network product line

BY JOANIE M. WEXLER
CW STAFF

IRVINE, Calif. — A long-anticipated move by Western Digital Corp. to exit the networking business was confirmed late last month when the company signed a letter of intent to sell its network adapter card product line to Standard Microsystems Corp. for $33 million.

Pending approval by the board of directors at each firm and Standard Microsystems' success in securing financing, the deal should be a *fait accompli* within three months, according to a Western Digital spokeswoman.

In the meantime, she said, customers will be doing business as usual with Western Digital for sales and support of the company's Ethernet and Token Ring network adapter cards. For one year following the close of the deal, Western Digital will reportedly continue to produce the boards for Standard Microsystems while the buyer sets up manufacturing facilities.

One local-area network industry analyst indicated that because the move complements the strategic goals of both vendors, the two customer bases should benefit. Western Digital intends to focus its resources on its core disk drive and controller businesses. Dataquest, Inc. analyst Shirley Hunt pointed out that "the way you sell those products and networking products requires completely different distribution strategies."

Having a separate group of people to manage the two areas "is not very efficient, even though the network adapter card business has been profitable for Western Digital," Hunt said.

Networking products account for about 8.5% of Western Digital's annual $1 billion revenue, which translates into about $92 million, according to the company.

Hauppage, N.Y.-based Standard Microsystems has been expanding its business of producing Arcnet adapter cards — a flat market — into the Ethernet arena. To stay viable, "all Arcnet vendors must move toward Token Ring as well," Hunt said.

INTERNATIONAL BRIEFS

Taking it to Taiwan

▶ **IBM** plans to increase cooperation with **Taiwan**-based software developers and may decide to invest directly in local software firms, IBM Taiwan general manager Henry Chow recently told the Taiwan business press. Through the end of May, he said, IBM will solicit proposals from software developers throughout Taiwan.

Unix in Hungary

▶ Unix for personal computers has arrived in Hungary, according to a news report from Budapest. **The Santa Cruz Operation** (SCO), the Santa Cruz, Calif.-based supplier that reportedly dominates the Unix-based PC market, recently set up an authorized distributorship with Hungary's **Areco Kft.** The agreement will help spread Unix throughout Hungary, local analysts said, given that Areco will also profit from the background support of SCO's worldwide network. Areco will offer SCO's entire product range.

Down the slippery slope

▶ Italy's **Ing. C. Olivetti & Co. SpA** recently reported that it will post 1990 pretax profits of approximately $100 million on sales of about $7.5 billion. That makes 1990 the fourth consecutive year of falling profits for the computer and business machines firm.

E.T., phone Pakistan

▶ Four major telecommunications equipment suppliers have submitted bids to install 500,000 telephone lines as part of **Pakistan Telecommunications Corp.**'s efforts to install 1 million telephone lines in Pakistan during the next two years, a news report from Islamabad said. The four contenders are Japan's **NEC Corp.**, Germany's **Siemens AG**, Swedish telecommunications player **Ericsson, Inc.** and France's **Alcatel**. The Pakistani Postal Telegraph and Telephone authority opened the bidding March 16 at its Islamabad headquarters.

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Control Data

CONTINUED FROM PAGE 77

well CDC can manage its existing and future partnerships, these analysts said. For example, in addition to a relationship with Mips Computer Systems, Inc., CDC has repackaged workstations from Silicon Graphics, Inc. since 1988.

The company also has joint marketing agreements with Convex Computer Corp. and Cray Research, Inc. for supercomputing alternatives.

"We are outsourcing the architecture because of the open systems move," Ousley said. "But our strategy still requires we add value to the hardware. What we're doing is not designing the CPU but embellishing around it."

The philosophy applies not only to the CPU but also to the chips. Last October, CDC sold its VTC, Inc. bipolar semiconductor operation to a VTC management team. In January, it sold the remaining VTC CMOS integrated circuit operation to Cypress Semiconductor Corp.

Meanwhile, Japan's CSK Corp. picked up the Micrognosis trading-room systems unit.

Moving to strengthen its financial position, CDC sold its common stock in Seagate and Silicon Graphics earlier this year, generating $153 million in cash.

The first product to come from CDC's joint technology development agreement with Mips Computer will be announced imminently, Ousley said.

In addition, he said, CDC is actively seeking software partnerships. Last year, the company announced an alliance with Wolfsburg, Germany-based Volkswagen AG to develop and market computer-aided design, manufacturing and engineering systems. Ousley said talks with other "data management and communications" companies are under way.

"We hope to have some additional alliances by midyear," he said, adding that these discussions include both Japan- and U.S.-based companies.

Asked if CDC will suffer more reductions in staff, Ousley answered, "We believe [we're] as lean as we're going to get, assuming our strategies are effective."

Changing hats?

According to CDC, its traditional markets — engineering and scientific computing — have been in the vanguard of the shift from proprietary mainframes to open systems and distributed computing. This is a trend that, in turn, has spurred CDC to rethink its focus and replot its future.

A case in point is CDC customer Asea Brown Boveri Ltd., a large engineering company that until very recently was a 20-year user of Cyber mainframes.

According to senior technologist Bob Kirkman, Asea made a dramatic and strategic choice to retire its top-of-the-line Cyber 990 mainframe in favor of a network composed of 80 workstations and four Unix servers.

"The big mainframe could do about 30 million instructions per second . . . The network will have 1,600 MIPS," said Kirkman, who works in the Zurich-based firm's Windsor, Conn., office. The price of the Hewlett-Packard Co. Apollo Division workstations was approximately $15,000 to $20,000 apiece, compared with $3 million to $4 million for the Cyber four years ago, he added.

Nevertheless, Kirkman did not abandon CDC. The four servers are CDC 4360-300s, reduced instruction set computing systems from Mips Computer that CDC introduced earlier this year. The server includes Awbus, an automated workstation backup system, another product offered by CDC this year.

CDC is ahead of an inevitable migration curve of the Cyber customer base of about 1,500 mainframes worldwide, "but not by much," according to Kirkman. Nevertheless, he said that from a technology and service standpoint, the company is far better suited to address the needs of data-intensive applications like his own than are workstation or start-up open systems vendors.

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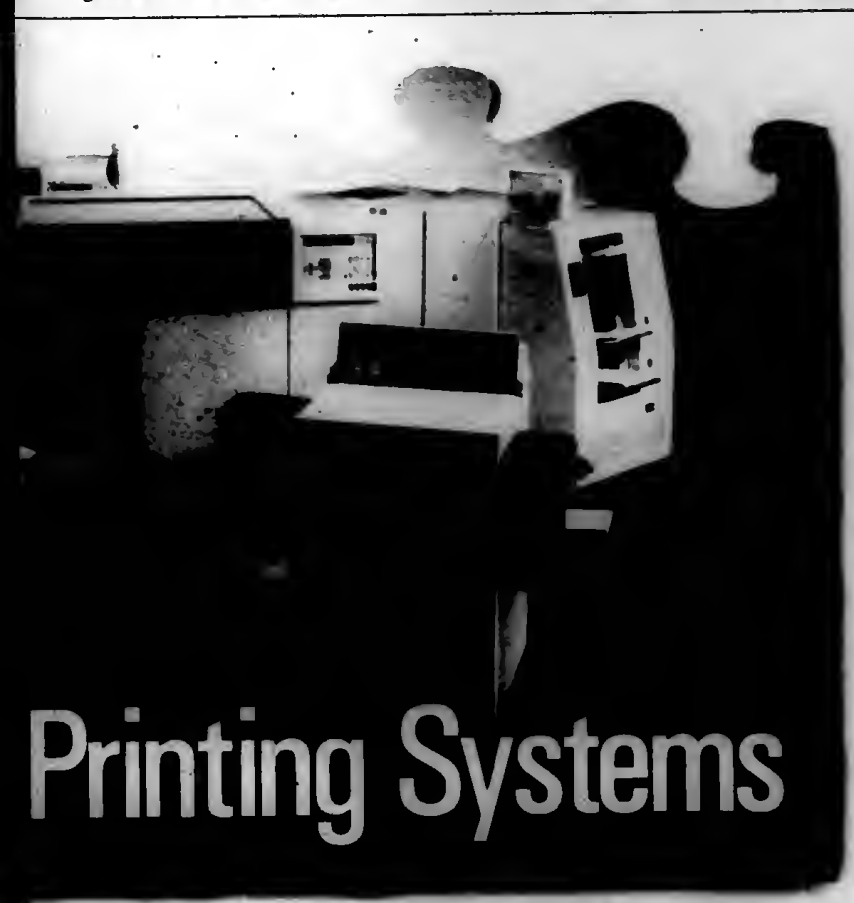

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Efficiency not weapons provides defense jobs

BY CHRISTINE CASATELLI
SPECIAL TO CW

Despite the allied forces' victory in the Persian Gulf war, U.S. defense companies are not experiencing a boon in new contracts. However, specific areas of technology that can increase the efficiency of U.S. Department of Defense (DOD) information services are providing new opportunities for defense industry specialists.

Even after the high-technology showcase of Operation Desert Storm, hard times at home are forcing the DOD to curb weapons development. Defense contractors that can translate business applications to DOD operations will receive the biggest windfall.

The DOD has resolved to manage its glut of information more like a Fortune 500 company. To back up its claim, the department has set aside roughly $9 million each year for information systems, with nearly half of the money being allocated to new systems.

The DOD estimates this plan will save $847 million over four years through the Corporate Information Management program, which will eliminate duplicate systems and set computing standards for the Defense Department, according to Pentagon spokeswoman Susan Hansen.

Another area within the DOD that is doing well is technology research and development. R&D is actually getting a financial boost at a steady annual rate of 5%, according to Brett Lambert, research associate at Defense Forecasts, Inc.

New technologies favored by the military include computer-aided logistics support, which will help the DOD transmit digitized design information over networks, and geographic information systems, which allow screens of graphic data to overlay one another.

In addition, the U.S. House of Representatives designated Ada as the premier programming language for the Pentagon late last year. The Defense Appropriations bill for fiscal year 1991 specified that all DOD software would be written in Ada when it would be cost-effective, beginning in June.

Some defense contractors are making a gradual shift into these technologies and others, which can be adapted to civilian or commercial applications, according to Robert Dornan, vice president at Federal Sources, Inc. in Vienna, Va.

Because specialties in geographic information systems and computer-aided design and manufacturing are in high demand throughout the high-tech marketplace, anyone with experience in either technology should be able to sell that skill to agencies and corporations alike, Dornan says.

The tight job market also means that defense firms can be more selective about whom they hire. "What I'm seeing is that defense contractors are looking for people with degrees in the sciences — engineering and computer sciences — not just experience in office automation," says Jim Lauducci, director of membership services at the Armed Forces Communications and Electronics Association in Fairfax, Va.

Job seekers with technical degrees have more clout in today's competitive market, and their salary levels will reflect their level of specialized education, according to Lauducci.

"People that have experience in managing computer systems but don't have the right degree may be in for trouble," he warns.

Future in defense

The following summarizes the hiring outlook at some major defense companies:

Computer Sciences Corp.
About one-third of Computer Sciences Corp. (CSC) business depends on defense contracts, compared with close to 40% just two years ago. Although it has played a support role in weapons systems, CSC has made a bigger name for itself in the area of DOD administrative and logistics systems.

"Of the seven computer systems used in the Gulf war, four of them had CSC as the prime contractor," says Gus Siekierka, director of human resources at CSC's Systems Group in Falls Church, Va. CSC information systems handled battle simulations, materials management, airlift processing and personnel logistics for the U.S. forces in Operation Desert Storm, according to Siekierka.

Despite its success with Defense Department information systems, CSC has been moving aggressively into geographic information systems for corporate clients as well as for the Environmental Protection Agency and the National Weather Service.

United Technologies Corp.
United Technologies has reduced its percentage of DOD business from nearly 50% in the mid-1980s to approximately 25% today. "United Technologies has been increasing its amount of international and commercial revenues over the last 10 years," says Lyle French, manager of IS at the United Technologies office in Washington, D.C. "We're trying to become more diversified.

"There's not going to be a big refueling of the stockpile of weapons that were used in Operation Desert Storm," French says. Though the shift in defense spending seems to be toward IS, United Technologies is opting to concentrate its efforts on big-ticket DOD aircraft contracts and on jet engines and automotive applications in the commercial sector.

French suggests that IS professionals interested in defense work gain some experience in computer-aided design. "More and more of our work in design and manufacturing processes involve computers," he says. "There are also Tempest facilities we use when working on projects for the Defense Department, so some knowledge of that is helpful."

Grumman Corp.
The uncertainty of the defense budget has halted hiring at Grumman in Bethpage, N.Y., for the time being, says Gerry Kennedy, director for systems and standards at the aircraft company. But when more DOD contracts start hitting the streets, Grumman will be recruiting people with expertise in Ada and computer-aided software engineering, according to Kennedy.

Diversifying into different industries is not in the cards for Grumman, which relies on the DOD for more than 80% of its business. According to Kennedy, Grumman's attempts to move to other markets have not met with much success. The defense contractor has dabbled in the nonmilitary arena with an order for 100,000 U.S. Postal Service vehicles, but the DOD will continue to be its biggest customer.

"I think the key is to stick with what you do best," he concludes.

Casatelli is a free-lance writer based in Washington, D.C.

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Directly manages an annual budget of $1.7 million and participates in long and short range planning for ACS with a total annual budget of $7.5 million. In addition, several innovative network management development projects are in progress, including a distributed Ethernet monitoring and management system that will be extended to FDDI networks.

The campus network consists of a large Proteon 80 Mbps fiber-optic token ring backbone with nine hubs, supplying connection to 85 buildings using fiber-optic 10 Mbps Ethernets. Several new buildings are being added to the network every month with the potential for as many as 200 buildings when it has matured. Plans call for the use of FDDI and other high-speed network technology as soon as possible. TCP/IP is the standard protocol, with plans for integration of OSI transport and applications protocols when that becomes possible.

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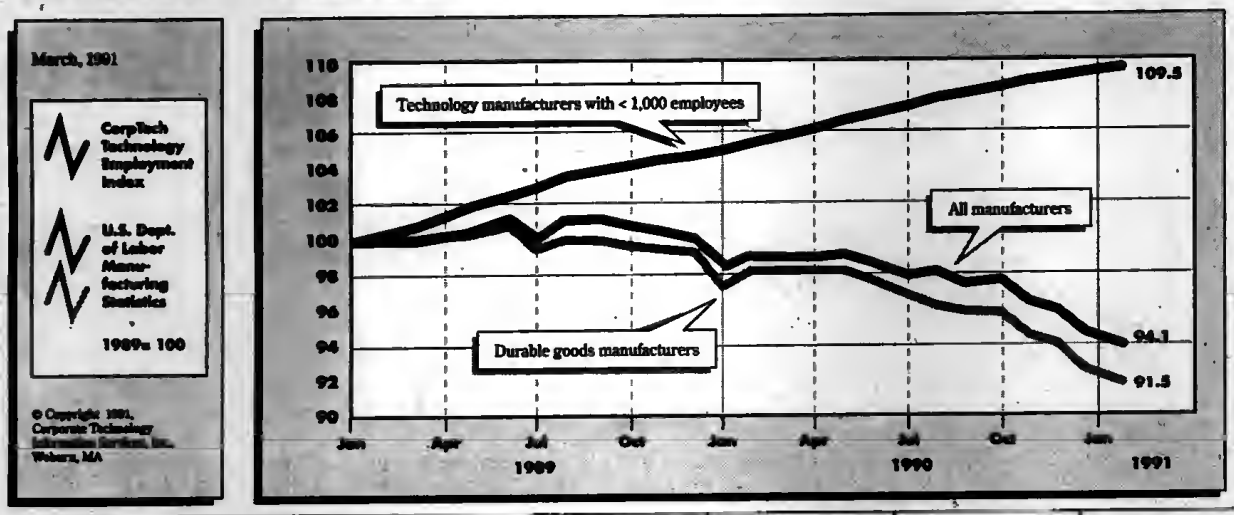

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Duties: Install and maintain VMS systems and layered products on DEC VAX mainframes and VAXStations in stand-alone or networked environments; maintain, expand or develop local system utilities; assist with INFOServer support for Consolidated Distribution of Digital Software; consult with faculty, staff, and students to assist in the analysis of hardware and software problems.

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Don't get caught holding the bag

Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY ERIC A. SAVAGE
SPECIAL TO CW

Consultants can be worth their weight in gold when it comes to swaying upper management on expensive IS proposals, but taking some simple, often overlooked precautions is essential to keeping them from becoming a legal problem.

• **Rule No. 1 — Put contracts in writing.** This is the first and most important rule. The nature and scope of a consulting engagement must be spelled out as precisely and objectively as possible so that the client and consultant know what to expect of each other.

This advice may seem almost insultingly simplistic. Unfortunately, the courts are replete with disputes between users and consultants triggered by the lack of a contract or by one that was poorly drafted.

Perhaps the most significant computer case in the past few years — and a powerful illustration of this rule — was *Diversified Graphics Ltd.* v. *Groves*, in which Ernst & Whinney was found to have failed to meet a professional standard of care in carrying out a consulting job.

The decision of the federal court of appeals edged very close to permitting a claim for computer malpractice (a theory that federal and state courts had rejected until then) and sustained a large monetary award.

However, the parties had never signed a retainer agreement spelling out whether Ernst & Whinney was supposed to review proposals and recommend a system, as it claimed, or supervise the installation, as the customer argued.

Such a fundamental disagreement is entirely avoidable with a written contract.

• **Rule No. 2 — Pin down fine details of the contract.** Specify the deliverables, define key terms, set deadlines and formulate the objective criteria by which the project will be assessed. This may seem simplistic or a waste of time, particularly when the project is on an expedited basis, but problems are far more likely to arise for IS managers who spend first and ask questions later.

• **Rule No. 3 — Decide who will retain the copyright.** As a general rule, the copyright to works prepared by employees in the course of their employment belongs to the employer under what is known as the "work for hire" rule set forth in the Copyright Act.

The rules governing copyright of works prepared by outside consultants are less clear and create only a presumption that the copyright will be owned by the client. This presumption can be defeated if the consultant can show that the express or implied terms of the contract reserve the copyright to the consultant. A specific contract provision allocating the copyright can prevent a costly dispute later.

As is typically the case, the ultimate decision is a business matter rather than a legal issue. These questions become legal problems when incomplete contracts force parties into court.

• **Rule No. 4 — Link payment of consultant to successful installation of project.** Another commonsense technique for ensuring maximum attention to client satisfaction is to have a significant percentage of the consultant's fee held until after the system is up and running for a specified period of time. Tying payment to objective performance criteria and successful installation is the best way to guarantee that a consultant will not disappear before the last acceptance test is finished.

• **Rule No. 5 — Determine consultant accountability.** In other words, find out who will be responsible if the consultant recommends the wrong equipment or writes a software package that doesn't work. There are two issues to be aware of: Many consulting engagements begin with a vendor's recommendation of a particular consultant to perform a job, but that doesn't mean you can hold the vendor accountable for the referral.

A federal court of appeals decided in *Electro-Matic Products, Inc.* v. *Prime Computer, Inc.* that a vendor's recommendation by itself does not make the vendor in any way responsible for the conduct of the consultant.

Clients that are seeking greater protection should try to directly involve the vendor in the project, either through a written guarantee of performance or by having the vendor review the consultant's plans and the company's IS needs.

The second issue to consider is that most consultants do not carry insurance for their work, especially if they are truly independent consultants. It's better to find out before the hiring stage if there is an insurance policy than it is to find out after the fact.

• **Rule No. 6 — Make provisions to obtain source code from the consultant if he goes out of business.** If you hire a consultant to develop a program for you, part of his responsibility is to update and modify it. If he suddenly goes bankrupt or is unable to continue performance for any reason, you'll need to access the source code.

A popular way to handle a situation like this is to deposit the source code in escrow with a third party subject for release upon specific events such as filing of bankruptcy, assignment of benefit for creditors or closing of business.

This should be done through a written escrow agreement, preferrably directly through a third party.

Obviously, each consultant engagement is unique. Nonetheless, an IS manager would do better to take the time to iron out the details now rather than later, when it may be too late.

Savage practices law at the Newark, N.J., and New York law firm of Hellring, Lindeman, Goldstein & Siegal.

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PS/2 Model 60	$1,300	$1,700	$1,300
PS/2 Model 70P	$3,300	$3,500	$3,000
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Close: *April 9*
15

Marketplace Section:
Should you maintain spare parts for your own repairs?
Product Spotlight: *CASE Tools*
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22

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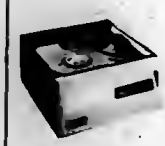
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Managers roll up their sleeves, get involved

Second part of a two-part series.

BY ALICE LAPLANTE
SPECIAL TO CW

If information systems managers could make three wishes about the graduates they hire from top IS programs, they'd most certainly ask for the same old stuff: business brilliance, crisper communications skills and more relevant technical training. But today, many IS managers aren't waiting for dreams to come true. They're providing the finishing touches themselves through training programs, college advisory boards and more selective hiring.

In an effort to more closely match what businesses want with what IS schools deliver, many managers are becoming more finicky in their hiring processes.

Hershey Foods Corp.'s systems development manager Kent Stapleton searches for graduates who elected to take more IS-oriented classes over those who concentrated on pure computer science. Students who focused entirely on technical issues are usually suitable only for systems programming positions, according to Stapleton.

"There's nothing wrong with systems programmers — we couldn't get along without them — but the number of those kinds of jobs is limited, whereas the number of jobs for business applications development is much larger," Stapleton says.

Other managers look carefully at the kind of technical training graduates receive. Randy Johnson, manager of an IS management training program at General Electric Co. in Bridgeport, Conn., says he looks for graduates with a strong grounding in traditional IS areas.

"Some of the programs at the schools are so state-of-the-art-oriented that they focus on technologies just arriving. For practical everyday use, it's not always a good match," Johnson says.

Well-developed interpersonal skills are also placed high on managers' selection lists. As a result, the managers prefer IS programs that encourage students to work in groups to solve problems or complete projects.

"It's essential that the students have had a chance to work on a team and that they are able to communicate well with coworkers," says Bard White, director of MIS at Spalding Sports Worldwide in Chicopee, Mass. "We'll take someone who works well with others over a technical wizard any day."

Kurt Green, manager of IS at Eli Lilly & Co. in Indianapolis, says Indiana University's IS program is especially good because the students spend a lot of time in teams of four or five people working on projects in an atmosphere that is comparable to the workplace.

Once they hire a graduate, many IS managers find it helpful to sharpen the new recruit's business and interpersonal skills by rotating him through different areas of the company to learn the business.

At Spalding, the new IS graduates are rotated through different positions within the entire company to learn about the culture — and the business — they will be designing systems for, according to White.

"We expose them to users right away, even before they begin coding," White says. "Then we send them outside of Spalding to make customer visits, attend trade shows and learn about our products and the competition."

Spalding hires four or five MBAs with specialization in IS per year and starts them as programmer/analysts in one of the firm's computing centers, but not before they learn about the business environment, something they simply don't get from school.

Joining the universities

For some managers, the best plan of action to get the types of IS graduates they want is to roll up their sleeves and join college advisory boards. Although it takes time, becoming involved in helping to shape an IS program ultimately helps managers because the graduates are better prepared when entering the work force.

As a member of an advisory committee at Pennsylvania State University at Harrisburg, Stapleton volunteered to help structure the curriculum so graduates would be better qualified for jobs within corporate IS.

"Recently, they sent out their proposed curriculum and asked us for our input," Stapleton says. "I told them it seemed like there was an awful lot of emphasis on computer programming, computer architectures and things like that. I thought they should increase their emphasis on business analyses and on the systems development life cycle."

Green, who received an IS degree from Indiana University 16 years ago, is active on the corporate advisory council at Indiana's computer science department as well as a similar committee that advises the business school. He says the school is "very responsive" to suggestions from the business community.

"We've seen some very good changes implemented recently and are eager to see how they will work out," Green says. A recent change to the IS undergraduate degree in the business school was to shift the program from being quantitatively based to having a greater focus on the application of technology to address business objectives.

"If your company does not get involved with the schools you recruit from and take an active role, you have to take what you get," says Jim Carlson, manager of human resources at K Mart Corp. in Troy, Mich. Carlson is very involved with several universities' IS programs.

However, the managers stress that there is simply no way any school — no matter how brilliant the teaching staff or well-endowed the facilities — can approximate the range and complexity of a corporate IS department.

"Compared to the variety of hardware and software we use here, what they learn in college is approximately 10% of the real world," says Paul Summer, MIS supervisor at Owens-Corning Fiberglas Corp. in Amarillo, Texas. "If the schools provide a solid grounding, we can do the rest."

LaPlante is a free-lance writer based in Palo Alto, Calif.

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April Training Editorial Topics

15 A former Saudi Arabian-based IS trainer describes the difference between there and here.
Executive Report: *Workforce Education*
Close: April 9

22 What's new with computer-based training?
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INDICATORS

Fiscal first-quarter financial statements are slated to start tumbling in next week, but the full impact of the current economic downturn remains unclear. Meanwhile, Clifford Friedman, large-systems analyst at Bear Stearns & Co. in New York, is trying to put the current recession obsession in perspective.

The U.S. and other countries are moving through a "global, rolling recession," Friedman said. The U.S. and the UK sank first and will emerge from business depths just as the German, French, Italian and Asian economies become increasingly sluggish, he added.

Thus, his investment strategy targets smaller hardware companies with strong domestic franchises that rely on international sales for less than 50% of their total revenue.

Another factor to consider is what Friedman called the "technology food chain," which indicates that large-systems vendors were pounded first and hardest by the business slowdown, while sectors such as semiconductors, peripherals and networking have suffered least.

RECOMMENDATION CHANGES

UPGRADED FROM HOLD TO BUY: Electronic Data Systems Corp. (EDS) (Prudential Securities, Inc.). Reason: Previous cautious opinion stemmed from reversals on two business deals, but EDS has done an excellent job signing up new long-term customers. EDS is the outsourcing vendor of choice in the 1990s.

UPGRADED FROM HOLD TO BUY: Linear Technology Corp. (Prudential). Reason: Firm profits from solid management and long product cycles for its analog semiconductors; 12-month target price is $21.

UPGRADED FROM NEUTRAL TO OUTPERFORM: Xicor, Inc. (Shearson Lehman Brothers, Inc.). Reason: At Shearson Lehman Brothers' Selected Growth Stock conference, Xicor executives said erasable programmable read-only memory chip orders were up and implied that the company will return to profitability by year's end.

UPGRADED FROM OUTPERFORM TO BUY: Integrated Device Technology, Inc. (Shearson). Reason: Stock valuation is now low; buy shares until they reach $7.50.

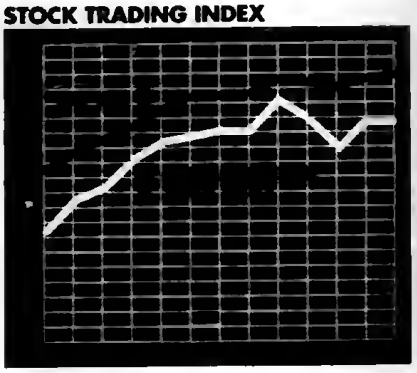
DOWNGRADED FROM STRONG BUY TO BUY: Equifax, Inc. (Bear Stearns). Reason: Acquisition of Telecredit, Inc. makes earnings unpredictable; current quarter will likely be flat compared with the same period last year.

DOWNGRADED FROM BUY TO NEUTRAL: Software Publishing Corp. (Alex. Brown & Sons, Inc.). Reason: North American shipments of flagship product Harvard Graphics below company's expectations, cutting into current quarter profits; predicates more conservative view of business for the remainder of the year.

DOWNGRADED FROM BUY TO HOLD: Advanced Micro Devices, Inc. (AMD) (Prudential). Reason: Stock price tripled since October 1990, pushed up primarily by excitement over the firm's clone of Intel Corp.'s 80386 chip. Although AMD has already started shipping the clone, it will not significantly contribute to profits for another few quarters.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Microsoft Corp. rocketed 7¾ points to 113¾ after news spread last week that it had signed a graphics licensing agreement with Silicon Graphics, Inc. However, Silicon Graphics lost 3 points to close at 36⅛. Compaq Computer Corp., which now owns 13% of Silicon Graphics, fell ⅛ of a point to 62½.
- NCR Corp. slipped 1⅞ points last week, closing Thursday at 97¾, as its standoff with AT&T continued. AT&T, meanwhile, inched up ¼ of a point to 34½.
- Other technology shares bounced around. Digital Equipment Corp. sank to 64⅝, losing 3½ points, while Apple Computer, Inc. stepped up 3½ points to 71½. Pyramid Technology Corp. rose 3 points to 27.
- Among semiconductor firms, Dallas Semiconductor Corp. and Exar Corp. reached new highs. Dallas closed Thursday at 11½, up one point, and Exar jumped 2¾ points to 18¾. Texas Instruments, Inc. also picked up 2¾ points, closing at 42¾.

Computerworld Stock Trading Summary

CLOSING PRICES FRIDAY, APRIL 5, 1991

TOP PERCENT GAINERS

Masstor Systems	38.38
Ariel Communication Corp	23.53
Oracle Systems	18.06
EMC Corp	17.72
Seagate Technology	17.19

TOP PERCENT LOSERS

Datapoint Corp.	-30.49
MAI Systems Corp	-21.37
Intellicorp Inc.	-20.00
Wang	-18.94
Fibronix Int'l Inc.	-18.08

TOP DOLLAR GAINERS

Novell Inc.	6.38
Adobe Systems Inc.	5.00
Motorola Electronics	4.78
Symantec Corp	4.75
Microsoft Corp	3.88
Silicon Graphics	-3.13

TOP DOLLAR LOSERS

Legent Corp.	-5.38
Digital Equipment Corp.	-4.25
BMC Software Inc.	-3.75
Wang	-3.13
Cray Research Inc.	-3.13

Communications and Network Services — Up 0.22

Exch	52-Week	Range		April 5 Close	Wk Net Change	Wk Pct Change
OTC	19.00	8.38	3 COM Corp.	8.50	0.25	2.70
NYS	39.75	23.50	American Info Techs Corp	39.38	-0.63	-0.89
NYS	44.13	29.00	AT&T	34.00	-0.25	-0.73
OTC	8.63	0.38	Ariel Communication Corp.	3.63	0.50	23.53
NYS	56.25	39.50	Bell Atlantic Corp.	49.75	-1.63	-3.18
NYS	57.63	49.00	Bellsouth Corp.	51.50	-1.75	-3.29
NYS	41.25	13.13	Cabletron Systems	37.63	1.63	4.51
OTC	25.88	9.25	Compression Labs Inc.	23.63	0.63	2.72
NYS	41.25	32.38	Contel Corp.	41.00	0.00	0.00
OTC	5.13	1.88	Data Switch Corp	4.38	-0.25	-5.41
NYS	26.75	8.88	Digital Comm. Assoc	19.50	1.38	10.64
OTC	25.25	12.25	Dynatech Corp.	21.25	1.00	4.94
OTC	13.88	5.50	Fibronix Int'l Inc.	6.25	-1.63	-18.08
OTC	4.00	1.50	Gandalf Technologies Inc.	3.13	0.13	4.17
NYS	4.50	1.63	General Datacomm Inds.	2.63	-0.25	-8.70
NYS	34.13	23.50	GTE Corp.	32.00	0.38	1.19
OTC	8.25	0.78	Intecom Systems Corp.	1.78	0.00	0.00
NYS	50.38	40.25	ITT Corp.	57.88	1.25	2.21
OTC	44.13	17.88	MCI Communications Corp	26.25	0.63	2.44
OTC	21.00	2.75	Microcom Inc.	8.25	0.00	0.00
NYS	18.25	4.00	Network Equipment Tech.	7.50	-0.50	-6.25
OTC	14.63	4.00	Network General	9.00	-0.50	-5.26
OTC	15.50	6.13	Network Systems Corp.	12.38	-0.38	-2.94
NYS	32.00	22.13	Northern Telecom Ltd	31.75	0.38	1.20
OTC	57.38	17.25	Novell Inc.	57.38	6.88	13.61
NYS	69.50	57.00	Nynex Corp.	72.13	0.38	0.52
NYS	47.88	38.25	Pacific Telesis Group	41.38	-1.50	-3.49
ASE	19.13	4.78	Parvi Corp.	14.63	1.00	7.34
NYS	39.13	8.88	Scientific Atlanta Inc.	16.38	-2.13	-12.14
NYS	58.50	47.25	Southwestern Bell Corp.	53.38	-2.75	-4.90
NYS	46.38	29.63	United Telecom	24.75	0.75	3.13
NYS	40.75	23.38	US West Inc.	39.50	-0.13	-0.32

Computer Systems — Off 0.65

Exch	52-Week	Range		April 5 Close	Wk Net Change	Wk Pct Change
OTC	8.75	0.88	Alliant Computer Sys.	1.63	0.00	0.00
ASE	16.88	10.00	Amdahl Corp.	15.88	0.25	1.30
OTC	72.75	24.25	Apple Computer Inc.	30.38	1.38	2.02
OTC	13.88	4.25	Archive Corp.	7.75	-0.88	-10.14
OTC	31.75	7.50	AST Research Inc.	29.50	2.25	8.26
NYS	7.38	3.50	Bull, Bertelsen & Newman	7.00	0.00	0.00
NYS	20.88	4.50	Commodore Int'l	20.88	2.50	13.61
NYS	74.25	35.50	Compaq Computer Corp.	63.50	-0.13	-0.20
OTC	3.50	0.13	Computer Automation Inc.	1.00	0.00	0.00
NYS	21.63	9.75	Control Data Corp.	13.13	0.13	1.04
NYS	20.88	9.38	Convex Computer	16.38	-1.38	-8.21
NYS	61.25	20.00	Cray Research Inc.	36.38	-3.13	-8.09
NYS	14.38	3.50	Data General Corp.	14.38	1.25	9.52
NYS	3.25	0.75	Datapoint Corp.	3.00	-2.38	-30.49
NYS	20.38	7.63	Dell Computer Corp.	28.75	0.25	0.88
NYS	39.13	45.50	Digital Equipment Corp.	63.88	-4.25	-9.24
NYS	39.13	13.75	Harris Corp.	26.38	1.13	4.49
NYS	91.75	34.25	Hewlett Packard Co.	39.00	0.00	0.00
NYS	139.75	39.25	IBM	113.13	-0.88	-0.77
OTC	14.00	7.75	Information Int'l	8.75	0.50	6.06
OTC	39.50	10.50	Intergraph	26.88	1.25	4.88
NYS	9.13	0.50	MAI Systems Corp.	0.88	-0.19	-21.37
NYS	149.38	114.00	Motorola Electronics	129.75	4.78	3.83
OTC	26.00	9.00	Mentor Graphics Corp.	16.63	1.38	9.02
NYS	100.50	44.50	NCR Corp.	36.38	-2.63	-2.84
OTC	35.50	11.00	Pyramid Technology	29.50	2.50	10.42
OTC	34.00	17.75	Sequent Computer Sys.	18.50	-1.75	-8.66
NYS	47.25	19.00	Silicon Graphics	36.75	-3.13	-7.84
NYS	39.13	14.63	Stratus Computer Inc.	33.00	-1.25	-3.65
OTC	37.25	15.00	Sun Microsystems Inc.	31.75	0.00	0.00
NYS	39.88	8.88	Tandem Computers Inc.	14.13	0.38	2.72
NYS	39.50	23.50	Tandy Corp.	33.25	0.88	2.70
OTC	23.25	8.75	Teradata	79.00	1.00	0.88
NYS	7.88	1.88	Ultimate Corp.	4.88	0.25	5.41
NYS	16.88	1.75	Unisys Corp	8.13	0.13	2.50
ASE	8.75	2.00	Wang Labs Inc. (b)	4.00	-0.38	-8.57

Software & DP Services — Up 0.50

Exch	52-Week	Range		April 5 Close	Wk Net Change	Wk Pct Change
OTC	39.00	17.50	Adobe Systems Inc.	69.00	5.00	9.26
OTC	39.75	18.75	Aldus Corp.	39.75	3.50	9.57
OTC	25.50	12.00	American Mgmt. Systems	25.50	0.50	2.00
OTC	19.25	7.50	American Software Inc.	11.50	-1.25	-9.80
NYS	4.63	1.38	Anacomp Inc.	4.13	0.00	0.00
OTC	23.50	10.00	Analysis Int'l	16.00	0.00	0.00
OTC	13.25	4.88	Ashton Tate	9.00	0.38	4.35
OTC	10.25	4.00	ASK Computer Sys.	7.75	0.00	0.00
NYS	67.00	45.25	Auto Data Processing	66.50	0.63	0.97
OTC	30.25	23.00	Autodesk, Inc.	49.75	-0.75	-1.49
OTC	31.50	13.50	BGS Systems Inc.	28.50	-1.00	-3.39
OTC	43.39	17.75	BMC Software Inc.	38.50	-3.75	-8.88
OTC	21.50	11.00	Boole & Babbage Inc.	14.75	-0.75	-4.84
OTC	61.50	14.00	Borland Int'l	60.25	2.25	3.88
NYS	8.88	0.38	Businessland Inc.	1.88	-0.25	-11.76
OTC	18.63	9.13	Cognos Inc.	19.38	0.88	9.83
NYS	18.88	4.38	Computer Associates	9.25	0.38	4.23
OTC	17.75	10.25	Computer Horizons	14.00	1.50	12.00
NYS	68.25	36.75	Computer Sciences	39.25	-0.25	-0.39
OTC	11.75	6.63	Computer Task Group	10.13	0.25	2.53
OTC	39.25	13.00	Comshare Inc.	31.25	0.50	2.41
OTC	19.00	3.76	Corporate Software	9.75	-1.50	-13.33
NYS	47.13	27.88	General Motors E (EDS)	47.13	3.25	7.41
OTC	18.75	7.25	Geac Systems Int'l	14.25	-0.75	-5.00
OTC	5.38	1.88	Hogan Systems Inc.	5.38	0.25	4.88
OTC	19.75	7.75	Information Resources	18.88	0.00	2.00
OTC	17.38	2.63	Informix Corp.	9.75	0.50	9.52
OTC	7.88	1.38	Intellicorp Inc.	2.00	-0.50	-20.00
OTC	8.00	2.50	Interleaf Inc.	7.75	1.13	16.38
OTC	40.50	10.00	Knowledgeware Inc.	40.25	0.38	0.94
OTC	49.00	18.75	Legent Corp.	33.00	-6.00	-16.39
OTC	39.25	12.50	Lotus Development	29.00	1.75	6.67
OTC	19.00	3.83	Micrografx	19.00	0.25	1.41
OTC	113.00	50.75	Microsoft Corp.	110.00	3.88	3.39
NYS	10.50	4.00	On Line Software Int'l	8.25	-0.13	-1.33
OTC	24.00	4.88	Oracle Systems	10.63	1.88	21.43
OTC	16.13	7.00	Parasitic Systems	11.25	-0.50	-4.26
OTC	6.88	1.25	Phoenix Technologies	5.38	0.50	5.97
NYS	52.00	31.63	Policy Management Sys.	50.75	1.75	3.57
NYS	23.63	11.50	Reynolds & Reynolds	29.00	0.75	3.90
OTC	19.00	8.88	Sage Software Inc.	10.38	0.00	0.00
OTC	39.00	14.75	SEI Corp.	34.50	-0.25	-1.01
OTC	19.13	12.25	Shared Medical Systems	16.50	-1.00	-5.71
OTC	35.25	12.00	Software Publishing Corp.	20.75	0.25	1.22
OTC	14.38	5.50	Sterling Software	12.75	0.38	3.03
OTC	26.00	9.50	Sungard Data Sys.	16.25	0.25	1.57
OTC	53.00	17.75	Symantec Corp.	53.00	4.75	9.84
NYS	34.50	4.50	System Center Inc.	7.50	0.75	11.11
OTC	37.38	12.75	System Software Assoc.	17.38	-2.50	-12.99
OTC	27.38	4.75	Wang	13.38	-2.13	-18.94

Semiconductors — Up 2.50

Exch	52-Week	Range		April 5 Close	Wk Net Change	Wk Pct Change
NYS	25.88	19.38	Advanced Micro Devices	23.88	1.88	8.52
NYS	11.88	8.38	Analog Devices Inc.	11.38	0.00	0.00
OTC	21.75	5.25	Chips & Technologies	10.50	-0.25	-2.33
OTC	53.75	28.00	Intel Corp.	46.25	1.50	3.21
NYS	13.50	5.13	LSI Logic Corp.	9.00	-0.50	-5.26
OTC	17.13	6.88	Micron Technology	17.13	0.88	8.43
OTC	33.25	7.25	MIPS Computer Systems	19.75	2.00	11.27
NYS	38.38	48.75	Motorola Inc.	57.75	0.50	0.87
NYS	9.63	3.00	National Semiconductor	7.88	0.25	3.51
NYS	48.75	22.38	Texas Instruments	41.50	1.63	4.08
OTC	12.25	3.00	VLSI Technology	8.75	0.50	6.41
ASE	14.88	4.00	Western Digital Corp.	8.13	-0.25	-4.88

Peripherals & Subsystems — Up 3.92

Exch	52-Week	Range		April 5 Close	Wk Net Change	Wk Pct Change
OTC	1.38	0.09	Alloy Computer Prod.	0.80	0.00	0.00
OTC	2.50	0.88	Apertus Technologies	2.38	0.13	5.56
OTC	24.00	7.50	Banctec Inc.	13.25	0.00	0.00
ASE	10.75	4.13	Cogniterics Corp.	10.75	0.25	2.38
NYS	31.25	14.63	Conner Peripherals	23.38	-1.13	-4.50
ASE	22.00	7.00	Datarem Corp.	10.30	-0.25	-3.46
NYS	11.63	4.25	EMC Corp.	11.63	1.75	17.72
NYS	47.25	33.75	Eastman Kodak Co.	42.38	-1.25	-2.87
OTC	10.00	3.38	Exabyte Corp.	8.25	-0.25	-2.94
OTC	34.38	14.00	Evans & Sutherland	21.00	-0.50	-2.33
OTC	6.50	3.75	Iomega Corp.	5.94	0.56	10.47
OTC	26.25	8.75	IPL Systems Inc.	23.25	0.00	0.00
OTC	1.75	0.13	Maxtor Systems	1.13	0.31	37.50
OTC	17.00	2.63	Mentor Corp.	5.25	0.00	0.00
OTC	14.00	3.38	Micropolis Corp.	14.00	1.63	13.13
NYS	93.75	73.63	3M Corp.	88.63	0.13	0.14
OTC	14.50	8.00	Pyramid Inc.	9.25	-1.25	-11.90
NYS	22.75	9.50	QMS Inc.	22.75	0.00	0.00
OTC	27.25	12.38	Quantum Corp.	24.13	-0.38	-1.53
NYS	8.13	4.38	Recognition Equipment	5.88	0.00	0.00
OTC	6.88	4.00	Reson Inc.	6.50	1.25	16.19
OTC	19.75	5.63	Seagate Technology	16.75	2.75	17.19
NYS	67.00	11.50	Storage Technology	37.00	3.75	11.30
OTC	4.00	1.25	Tandon Corp.	3.31	-0.06	-1.84
NYS	24.50	11.63	Tektronix Inc.	24.50	1.25	5.38
OTC	0.63	0.19	Telebyte Systems	0.38	0.00	0.00
NYS	68.25	29.00	Xerox Corp.	57.50	0.00	0.00

Leasing Companies — Off 1.09

Exch	52-Week	Range		April 5 Close	Wk Net Change	Wk Pct Change
OTC	16.25	9.88	Amplicon Inc.	15.25	0.00	0.00
OTC	4.38	0.31	Capital Associates	0.69	-0.06	-8.27
NYS	26.38	14.63	Comdisco Inc.	26.00	0.38	0.67
OTC	10.25	8.25	LDI Corporation	13.75	0.25	1.85
OTC	8.88	2.25	Telecom Inc.	4.00	0.00	0.00

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Wang to focus on work groups

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. unveiled its Office 2000 strategy last week, drawing a faint outline of future directions and singling out the departmental work group as Wang's target customer.

Richard W. Miller, Wang's chairman and chief executive officer, issued a six-page letter to customers that outlined the strategy's "building blocks."

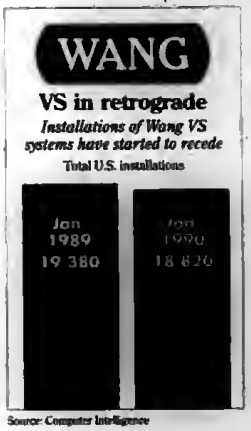
The letter gave little mention of the future of the VS system, but Miller said in an interview last week that Wang would continue to upgrade VS in terms of both price and performance and that users could expect significant announcements in terms of connectivity.

While specifics are not yet available, Miller said there will be subsequent announcements and distribution of materials "as we go forward" with the next mailing scheduled for mid-April.

"The purpose of the letter was to describe a process for rolling out a strategy," Miller said.

At this point, the Office 2000 focus is on targeting work groups within defined strategic markets, including financial services, government, legal and professional services, manufacturing and health care.

Wang's document said the company will aim to bridge the gap between enabling technologies and work-group reorganization by building work flows tailored to business processes, but it provided no specifics.



Customers are waiting for Wang to sketch in further details. "Office 2000 is very broad at this point," noted Matthew J. Gillman, president of the U.S. Society of Wang Users. "Getting strategy in place is a good thing, but we need more details."

John T. Crawford, vice president of information management at The Hartford Insurance Group, observed that the policy could prove beneficial to users if Wang can provide the same price, performance and CPU capacity on its open systems products that are currently offered in the VS domain.

Crawford added that he is waiting for the next wave of Office 2000 announcements and is eager to learn the specifics on upcoming plans for the VS line. The Hartford has approximately 100 VS systems installed nationwide.

A Wang customer at a large VS installation on the West Coast who did not want to be identified viewed the announcement favorably.

"Wang has finally stated a direction toward open systems and open architecture, which was absolutely essential," the customer said. "They had no choice."

Ann Palermo, an industry analyst at International Data Corp in Framingham, Mass., said Wang has realistically relinquished enterprise-oriented business to Digital Equipment Corp. and IBM.

"Wang's recognition of the work group puts them into the land of opportunity," Palermo said, adding that the field is wide open, and there are no other definitive, existing solutions.

Office 2000 will be implemented in phases during the remainder of 1991.

Upgrade uproar

Wang Laboratories angered the third-party/used equipment community last week by stating that its proprietary VS operating system has a nontransferable license policy.

The action could make it difficult for customers to buy and sell used Wang computers. VS operating system licenses used to be transferable for a $1,000 fee, sources said.

Wang maintained that transfer licensing fees for the VS operating system range from $2,000 for a VS 5 to $100,000 for a top-of-the line VS 10000 machine.

Wang officials contended the company is clarifying policies that have been in place since 1987, but both users and used equipment dealers disagreed.

"What I know about it gives me concern as a user, as it takes money directly out of my pocket," said Stanley C. Hatch, a principal at Hatch & Parent, a law firm in Santa Barbara, Calif. The firm is a seven-year Wang customer and has always been pleased with Wang technology.

"As soon as Wang starts enforcing this policy, people are going to protest, and Wang is going to see what a truly poor policy it is," Hatch said.

Titled "A Simple Message to Customers," Wang's recent communique said that if a user buys a complete, used VS CPU from a third party, the former owner can ask Wang to transfer the license to the buyer, and if said owner has a valid operating system license, Wang will conduct the license transfer.

The former owner is prohibited from selling any Wang applications with the VS computer. Also, if a customer buys a board-level upgrade from a third-party vendor, the customer must purchase a complete new operating system license.

In either case, according to Wang, customers must acquire the necessary operating system licenses before Wang will install or support the procured hardware.

SALLY CUSACK

Firestone

FROM PAGE 1

Various software components and documentation either were delivered late or not at all or did not work well with Firestone's computer platforms or the private, integrated voice and data network it created for the project, the suit charges.

Firestone officials declined to comment on the lawsuit or the status of the Mastercare project last week.

Oracle's court memorandum began by asserting that "Firestone seeks to expand a straightforward breach of written contract claim ... into a multifaceted donnybrook."

The Belmont, Calif.-based software firm has asked the court to dismiss certain claims in the suit and strike what it calls "excessive damage claims."

Oracle initiated the legal action. On Feb. 21, it filed a complaint in Superior Court in San Mateo, Calif., for $1.358 million, the balance of the $2.05 million contract.

The case could hinge on whether the court sides with Firestone in believing that the written contract was predicated on the representations made in earlier Oracle oral statements and written presentations.

The written contract, Oracle maintained, contains language stating that the written contract supersedes all previous agreements, written or oral.

Even if the court finds in favor of Firestone for all its allegations, an addendum to the written contract limits Oracle's liabilities to $2 million, Oracle corporate counsel Cynthia Greco Herr said.

Blameless

According to Herr, one pillar of Oracle's defense will be that the fault lies not with Oracle's products but with Chicago-based TSC, the onetime systems integrator on the project. TSC is not named in either the Firestone complaint or the Oracle memorandum.

"TSC designed this project," Herr said, adding that the plans for the system changed repeatedly and that TSC did not know how to use Oracle software or work with Oracle technicians.

TSC's plans, Herr said, included the use of beta-test versions of Oracle software for development, a strategy that Oracle would never have used, she added.

TSC President Albert D. Beedie Jr. said his company, which was hired by Firestone in October 1988, worked well with Firestone. By the time the project was shelved, he said, 400 of Firestone's 1,600 service stations were on the network, and the system was showing benefits.

TSC left Firestone in August 1990, two months after the departure of John Rooney, general manager of the Mastercare unit, Beedie said.

Rooney, who left Firestone in May and is now vice president and treasurer at Chicago-based Ameritech, supports TSC's version of events.

"TSC had nothing to do with the problem," he said, adding it was "hogwash" to put the blame on the systems integrator.

If the applications software was a problem, so was the communications package Firestone expected, according to the lawsuit.

Oracle was required to provide a version of SQL*Net able to work efficiently on telecommunications lines, but the version that was delivered worked well only on a local-area network, according to the Firestone suit.

In addition, Firestone complained that Oracle never delivered DB2-Connect, software designed to access Firestone's DB2 database from SQL*Forms 3.0.

AT&T set to unveil upscale notebook PC

BY RICHARD PASTORE
and MICHAEL FITZGERALD
CW STAFF

AT&T will announce an Intel Corp. 80386SX notebook personal computer later this month that will propel the vendor from a portable no-show to the forefront of notebook PC technology, according to users who have seen the system or have been briefed by AT&T.

The features that set the Safari notebook apart are its optional, cellular 2,400 bit/sec. fax/data modem, six-hour battery life and read-only memory-resident version of Microsoft Corp.'s Windows 3.0. The modem allows data and fax transmission without a telephone connection, while the chip-resident Windows will provide instant Windows execution, sources said.

The product, which costs about $5,500, will debut the week of April 22, sources said. It will weigh slightly over 7 pounds with battery and will feature a 10-in., nonreflective IBM Video Graphics Array (VGA) screen and a minimum of 2M bytes of memory. The dimensions are 9½ by 12 by 1½ in.

AT&T acknowledged it has a notebook in prototype stage but would not discuss details.

The unit will first ship with a 40M-byte hard disk, sources said, but AT&T has promised users an 80M- or 100M-byte drive as early as June.

Users who have seen Safari said they were impressed. "I wasn't even going to talk to them until I heard it had an 80M-byte hard disk," said one information systems manager who asked not to be identified. "We're already pushing the 60M-byte capacity" in current laptop PCs, the manager said.

Another IS director said he was very impressed with the 10-in. VGA screen, which had extremely sharp contrast.

However, some analysts were put off by the chip-resident Windows. Upgrading the operating system will be expensive, inefficient and slow in comparison with disk-resident versions, said Will Fastie, editor of "The Fastie Report" in Baltimore.

Safari, which has been described as resembling fine luggage, "has some really distinctive styling, which will set it apart from other vendor entries," one analyst said.

Users added that AT&T will offer a docking station for the PC and said the firm will sell Safari directly via its sales force.

NEWS SHORTS

New Wave Office 3.0 due

Hewlett-Packard Co. will announce New Wave Office Version 3.0 this week. The new version features more connectivity to the Unix platforms of several other vendors, including IBM and NCR Corp. The software, which includes more than 20 modules — such as mail and graphics — will also reach out to the Apple Computer, Inc. Macintosh "initially for terminal emulation," according to Michael Goulde, an analyst at Open System Advisors, Inc. in Boston.

HP re-reorganizes

HP realigned its computer businesses by methods of sale last week. This is the third reorganization since last fall. Products sold through dealer channels, such as personal computers and calculators, are now under the new Personal Systems Group, headed by Bob Frankenberg. Most computers and systems software are now under the Networked Systems Group and Wim Roelandts. Frequent HP reorganizations have left analysts nonplussed by such news. "So what, other than it's disruptive," said Sandy Gant, an analyst at Santa Clara, Calif.-based Gartner Group/Infocorp. "They still have workstations and PCs sold by different groups. It should be on a continuum."

Phone companies consider alliance

Three of the world's largest telephone companies said last week that they are considering an alliance to offer integrated telecommunications services to multinational corporations. British Telecommunications PLC in the UK, Nippon Telegraph & Telephone Co. in Japan and the Deutsche Bundespost Telekom in Germany would offer one-stop shopping for network services, including network planning and management. A spokesman for BT said the partners hope to make further announcements later this year. IBM confirmed it had been approached by BT to become one of the first customers of the service but said it did not have plans to join the group.

First arrest in Sundevil case

Arizona law enforcers announced last week the first arrest in Operation Sundevil, a year-long federal and state investigation into illegal computer hacking. Baron M. Majette, 19, was arrested on six counts of fraud and conspiracy. Authorities said Majette, who reportedly used the moniker Doc Savage, set up two unauthorized conference calls worth about $8,100 with hackers in several states, used a stolen credit-card number to ring up more than $50,000 in unauthorized charges and illegally accessed a TRW Corp. database to obtain personal credit history and credit-card numbers.

ATM networks plot debit system

Twelve regional banking networks are considering interconnecting to form a nationwide debit-card network, which would allow consumers to instantly deduct purchases from their checking accounts at the point of sale, according to John B. Benton, the project's a consultant in Torrance, Calif. The proposed network is not expected to run into antitrust problems, as did a 1989 joint venture by Visa International, Inc. and Mastercard, because it will provide competition for the on-line debit systems that Visa and Mastercard are now planning separately, said Mark Brohan, editor of the newsletter "Bank Network News."

Federal IRM posts filled

The federal government has filled two new and powerful information resource management (IRM) positions. Information systems expert Paul Strassmann has become director of defense information at the Pentagon, where he will oversee IRM for the entire U.S. Department of Defense, including the massive new Corporate Information Management program with which the Pentagon hopes to eliminate redundant computer systems. He is a former Xerox Corp. IS executive. At the U.S. Department of Justice, Roger M. Cooper has become deputy assistant attorney general for IRM. Cooper has held similar posts at several other agencies and is recognized for his knowledge of computer security.

Salomon Brothers loses top IS exec

BY CLINTON WILDER
CW STAFF

NEW YORK — Salomon Brothers, Inc. changed top information systems executives last week as Francis A. Dramis Jr. departed after two years to return to the vendor world.

Dramis *seduced to head Network Management, Inc.*

Dramis, formerly president of Salomon Technology Services, Inc., was named president and chief executive officer of Network Management, Inc., a fast-growing systems integration and consulting firm in Fairfax, Va.

Dramis, who headed a small network software firm before joining Salomon in 1989, will begin his new job later this month.

Salomon named Peter L. Bloom, senior operating officer, as acting head of the technology division. A spokeswoman refused to comment on whether Bloom's appointment was temporary or if the firm would commence a search for a permanent replacement. Bloom, a nine-year veteran at Salomon, could not be reached for comment.

Network Management Chairman Howard Frank said he wanted to hire Dramis two years ago and called the appointment "a matter of seduction more than anything else. I don't think we could have attracted him" two years ago, he said. "At that point, we still had some proving to do."

Dramis has been on the firm's board of directors for the past two years; Salomon is a Network Management customer. Network Management has about $60 million in revenue and 500 employees.

Dramis worked at AT&T for several years, both in internal IS and on the product side. He was vice president at American Transtech, the AT&T stock trading system subsidiary. He left AT&T to head Telic Corp., a Rockville, Md., developer of network management software.

The transition to Bloom is not the only change in the wind at Salomon. The firm plans to move 700 operations jobs by 1993 to Tampa, Fla., where it is building a new technical center.

Pan Am

FROM PAGE 1

used by Continental Airlines.

Pan Am, which filed for Chapter 11 bankruptcy protection in January, is strapped for cash. Although it recently sold several routes to United Airlines, it was hit last week with a federal court order to pay $33 million owed on leased planes or give up the aircraft. Analysts said the outsourcing deal could fetch Pan Am at least that amount.

The plan would have Pan Am contracting its present IS services and future development from the outsourcing group, which would remain located in Pan Am's site in Rockleigh, N.J. Among those services are voice and data communications, microcomputer support, applications development and maintenance, data center operation and maintenance of all equipment worldwide.

Pan Am also hopes to benefit from economies of scale once its software and services are marketed to second- and third-tier airlines. "Pan Am having such significant software is a wonderful thing to leverage," Wagner said. "It's a very comprehensive, complete system that could provide [other airlines] with better service than they have today."

Among the applications Pan Am's systems handle are marketing impact analysis, crew management, reservations and departure control as well as financial reporting.

The deal would rank among the largest half-dozen outsourcing contracts ever closed, according to Stephen McClellan, vice president of securities research at Merrill Lynch & Co. in New York.

"It makes eminent sense for Pan Am," McClellan said.

Continental Airlines' bid to outsource its data center and that of Eastern Airlines, which also uses the System One reservations system, is now hung up in bankruptcy court. EDS and IBM are both bidding on that contract, which has been estimated to be worth billions. A hearing on the contract is scheduled to take place April 19.

Perot wins 10-year outsourcing deal

BY GARY H. ANTHES
CW STAFF

Beating out IBM and a number of other systems integration giants, Perot Systems Corp. won one of its largest contracts ever last week: a 10-year, $400 million outsourcing deal with First American Bankshares, Inc.

Perot Systems will take over all the information systems functions of the bank, including applications development and maintenance, data center operations and telecommunications.

Paul G. Adams, chairman of First American Data Services, Inc., the bank's IS subsidiary, said all of the subsidiary's 200 employees will be hired by Perot Systems if they pass a drug screening test. Adams is also chief financial officer at the parent bank and will remain with it. First American Data Services, with $11 billion in assets, operates eight banks in Washington, D.C., as well as in Virginia, Georgia, New York, Maryland, Florida and Tennessee.

Adams said the outsourcing arrangement stemmed in part from having "a huge data center with much more capacity than we need." The Reston, Va., data center, which contains an IBM 3090 Model 600 mainframe and a number of Digital Equipment Corp. VAX boxes, was built in 1985 to meet growth goals that were never met, Adams said. Perot Systems will use the extra capacity to serve other customers, he said.

Although Adams talked to a number of outsourcing vendors, the choice ultimately came down to Perot Systems and IBM because they were the two vendors that needed additional capacity in the Washington area. "We looked for someone who could run more plankton through the whale," Adams said.

Another impetus to outsource was the bank's need to substantially upgrade its loosely coupled applications, which include commercial and installment loan processing, a deposit system, branch automation (including automatic teller machine systems) and more than 50 others, Adams said.

Perot Systems will develop an "information architecture" that will integrate the applications through a new relational database while providing better integrity and auditability. Adams described the current applications as "a variety of jury-rigged systems difficult to prove at the end of the day." The deal is expected to save the bank 10% to 15% per year, Adams said.

Military sees problems, promise in viral strikes

BY MICHAEL ALEXANDER
CW STAFF

The notion that computer viruses could be used to wage electronic warfare is getting a hard look by the U.S. military following the war in the Persian Gulf.

Along with the military's ever-increasing reliance on electronic weaponry and command-and-control systems has come the prospect that computer viruses could be used to wage electronic warfare, said Myron Cramer, a senior associate at Booz, Allen & Hamilton, Inc.'s technology center in Bethesda, Md.

"Viruses are a significant threat because software is what is directing the next-generation systems that are being built today," Cramer said. "Target acquisition, battlefield management and related networked computer systems are at greatest risk."

Thousands of personal computers at army installations have been infected with Jerusalem-B, Stoned and other viruses in recent months. Computer security specialists checking PCs that were destined for the Persian Gulf during Operation Desert Shield uncovered three strains of computer viruses.

"Luckily, the viruses were found before the war started," said Jim Dimler, automatic data processing security officer at Defense Systems Management College in Fort Belvoir, Va. "I wonder what would have happened if any of the systems were involved in the war."

Guarding against viruses

Dimler instructs high-ranking officers responsible for acquiring weapons systems, computers and other equipment and representatives of government contractors about the potential problems of viruses and how to guard against them. "I am also telling them that there should be a clause in their contracts that requires products that are delivered to the military to be virus-free."

"With Desert Storm, people are much more aware of their dependency on computer systems," said Jim Christy, chief of the computer crime division at the Air Force Office of Special Investigation. The number of virus-infected military computers has "increased dramatically," and military security experts are "exceedingly motivated" to combat the problem, Christy said.

The military is also exploring the possibility of adding viruses to its own arsenal as well as defending against those launched by aggressors. The U.S. Department of Defense, through its Army Small Business Innovation Research (SBIR) program, is currently funding two projects, worth $50,000 each, aimed at determining the vulnerability of weapons systems software to viruses and whether it is feasible to develop a virus that can be transmitted by radio into military command-and-control systems.

The primary goal is to develop "virus-proof" code, said Doug Price, division manager for the research and development group at Sparta, Inc., a technical research firm based in McLean, Va., that was awarded the two SBIR contracts.

Creating so-called "assassin viruses" that could take out enemy systems, however, is "harder than it sounds," Price said. "If you don't care what the target is, and all you want to do is cause havoc, that is one thing; but that is not a reliable weapon."

It is the third such project funded by the SBIR program in the past year, according to Joseph Forry, program manager, U.S. Army C-Com, SBIR. If results of the feasibility studies pass muster, Sparta will become eligible for additional funding worth $500,000 per project for further research and development work, Forry said.

Application Configured Computers, Inc., a small software developer in Baldwin, N.Y., has been experimenting with viruses and other programs that could be used in a strike against high-technology weaponry, according to Thomas Sobczak, the software developer's vice president and technical expert.

The result of the company's research into what it calls "psycho-electronics" includes a program that causes video screens to flicker imperceptibly, triggering headaches in unsuspecting radar screen operators and others who use displays.

Another sort of virus could jiggle the clock rates of critical computer chips, causing the chips to heat up to a point where they would self-destruct, according to Sobczak.

Security

FROM PAGE 1

Dolan said.

Portable computers, which are selling briskly, also pose new security challenges. Not only can portables and the information they contain be easily stolen, but users can also tap into corporate databases on the road or siphon information through the serial port of desktop systems, perhaps without authorization.

Local-area networks, which too often lack adequate security features, are probably the weakest security link, according to these and several other security experts. It is relatively simple to connect an unauthorized terminal to a LAN that could be used to intercept passwords and data, for example. It is also easy for some departments to install LANs without security involvement, Dolan said. "Our challenge is knowing where the LANs are," Dolan said.

One worrisome trend is that increasing numbers of employees are taking computers home for telecommuting or after-hours work, the experts said. In addition to having to secure the added entry points into the corporation's systems, there is no way to monitor how the information is secured once it is downloaded.

About 25% of Digital Equipment Corp.'s 115,000 employees have computers at home, said James Schweitzer, corporate manager of information security. "The PC is the responsibility of the individual user in the office or at home," he said.

"Telecommuting will unquestionably increase our risk," said Jane Paradise, manager of corporate information security at Apple. Impending transportation restrictions in California aimed at curbing the number of commuters are forcing many companies to offer employees the option of telecommuting. Apple will launch a telecommuting pilot program next month "with legal and safety rules from a security standpoint," Paradise said.

Three of the four security chiefs said their companies rely on end users to determine the value of information that resides on their desktop computers and file servers and be responsible for securing it. Dolan, the fourth chief, said his company's managers were charged with the ultimate responsibility for safeguarding company information.

HP has 55,000 PCs and 16,000 workstations, according to Sam Miller, information technology engineer at HP. About 20% of the PCs and virtually all of the workstations are tied into LANs.

"Information security is new at HP; it has not been in existence but a year and a half," Miller said. "Before that, it was a free-for-all where everyone did their own thing." Today, the IS department handles security, but that "leads to problems in engineering and marketing, [which] may not recognize IS' authority in handling this."

Budget to join data centers

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — Budget Rent-A-Car Corp. will consolidate its three regional data centers into one national data center by the end of 1991.

Budget, a $2.5 billion firm, is building a 20,000 sq-ft data center in Lisle, Ill., outside of Chicago, on land acquired as part of a headquarters move. Budget will also switch from a decentralized system of data management to a centralized, cooperative processing approach.

Currently, the company uses 12 IBM System/38s and Application System/400 Model B70s with dumb terminals at all its counters. When the move is complete, all Budget counter workers will use personal computers hooked into a mainframe-class machine, according to Kevin McShea, senior vice president of Budget's technical services group. McShea declined to say whether the mainframe and PCs would be IBM machines.

Budget was making the data center move because "we're going to be far better serviced by having central control of information," McShea said.

The shift in processing has not been budgeted, nor is there a set timetable for shutting down the regional operations, McShea added. Total information systems employment will probably fall from 160 employees to between 65 and 120 as a result of the consolidation.

IBM Japan's notebook offers preview

BY MICHAEL FITZGERALD
CW STAFF

The Personal System/55 Model 5523-S, a notebook computer released in Japan by IBM, offers a preview of the notebook IBM will offer to U.S. buyers some time later this year.

Announced by IBM Japan one day after the PS/2 Model L40SX officially hit the U.S. market, the PS/55 notebook weighs 5.5 pounds and offers a 9½-in. IBM Video Graphics Array display, 2M bytes of random-access memory upgradable to 6M bytes, the option of a 3½-in. floppy disk drive or a 40M byte hard drive and runs Japanese DOS J4.0/V. It has a 32-bit architecture and is based on a 12-MHz Intel Corp. 80386SX chip. Japanese pricing equals $1,669 to $2,647 in current U.S. dollars.

An IBM spokesman said IBM Japan's personal computers were similar but not identical to its U.S. models, and he said the same would probably hold true for the U.S. notebook due out before the end of 1991. Analysts predicted that the machine will reach the U.S. market sometime late this summer. IBM would only confirm that it plans to introduce a notebook PC in the U.S. before the end of the year.

Users who heard the specifications were lukewarm. "We'd look at it," said Bob Peterson, director of sales and marketing information systems at Coors Brewing Co. in Golden, Colo. "We're getting into a lot of applications where it's going to require a lot of data storage."

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TRENDS

IBM and Amdahl Mainframes

IBM's high-end mainframes are expected to hold an edge in value over Amdahl's competing systems

Retail residual value
(in thousands)

Model	Announced	List price	Jan. '92*	Jan. '93*	Jan. '94*
IBM 9021-900	Sept. 1990	$22,568	—	$11,284	$7,673
Amdahl 5995-4550M	Sept. 1990	$18,900	—	$8,505	$5,670
IBM 3090-600J	Oct. 1989	$13,490	$4,721	$2,698	$1,349
Amdahl 5990-1400	May 1988	$12,220	$3,788	$2,322	$978

Used retail value as a percentage of list price

*Projected

Source: Technology Investment Strategies Corp., Framingham, Mass.

CW Chart: Tom Monahan

NEXT WEEK

User empowerment is more than just a buzzword at PHH Homequity, a relocation firm in Wilton, Conn. Under the guidance of **Bradley Calcagni**, director of business systems development, technology management and consulting, Homequity has developed LAN-based applications that improve business processes. See Manager's Journal. ▶

Reinhold Spengler

End-user training in many companies gets mediocre grades for performance and effort. The reasons: poorly prepared IS trainers, lack of teamwork with human resources and indifference. However, Executive Report looks at IS executives such as Dave Pitts at Hills Pet Products who are taking innovative approaches to end-user training.

INSIDE LINES

5.0 is really ready to go

A source tells us that Microsoft's DOS 5.0 is now slated to ship in June, and when it does, it will — surprise! — become "very Windows-like" in behavior. A Microsoft representative confirmed the date and said the characterization is not inappropriate. One can only hope this does not mean an endless assault of the ubiquitous UAE — unrecoverable application errors — that are plaguing Windows users. In the span of a few hours last week, one reporter talked to three Windows users who had felt the sting of UAE — one woman had lost five pages of a speech.

A mini vendor's dream come true

Sources at Allstate Insurance say the big insurer, daunted by PC upgrade costs for its nearly 15,000 agencies, has chosen to install Application System/400s at the rate of 50 to 100 agencies per week until all of its agencies run off the IBM minicomputers. Allstate, in keeping with its tradition of not talking to the press, refused to comment.

Is Mumps getting more contagious?

Mumps, the application environment originally developed for medical systems, has spread to about 75,000 users worldwide, including nonmedical companies such as Chase Manhattan, a Mumps User Group spokeswoman tells us. Next week, Mumps will officially take on an "open systems architecture" to allow data sharing among different Mumps systems — in particular, PCs and VAXs. Sounds like the start of an epidemic.

Through the looking glass

Users and various industry sources have been telling us that 1-2-3/Windows was supposed to go into beta testing in early, then mid-March. But then we heard it was a no-show, mysteriously pulled back for three weeks. Lotus responded that it is not in beta testing and that it is not supposed to be. In fact, everything is "tooling right along" on schedule, Lotus says. So we pointed out that Lotus won't be able to ship in June unless it moves into beta testing soon. Sayeth Lotus: "Stay tuned."

That report not from any Ami of his

"They don't have the facts right." That's the response of Said Mohammadioun, vice president of Lotus' Word Processing Division and formerly president of Samna, to a published report last week charging that Lotus has fallen behind on shipping free copies of the Ami Pro word processor to purchasers of 1-2-3 Release 3.1. Mohammadioun said there are no Ami orders in the system more than two weeks old.

Please don't say we're ISDN!

One industry consultant recently acknowledged that some "full-service" vendors who have added Integrated Services Digital Network (ISDN) equipment to their product lines have actually requested that the consultant *not* recommend their ISDN products to clients. The reason, the consultant says, is because the price of servicing and supporting the products costs the vendor more than the sale is worth in an anemic ISDN market.

The wonders of the computer age

Panelists and attendees at the Information Systems Security Association were not a bit shy about blasting LAN makers and other vendors for what they said are inadequate security features. One speaker, only half jesting, suggested that some products should come with a warning label: "Caution, use of this product could be hazardous to the health and welfare of your organization because of security and control deficiencies."

Observers sometimes have a rough time separating the reality from the dream of DEC's grander schemes, and last week's Polycenter systems management platform is no different. It didn't help that a DEC business unit head made a slip of the tongue and referred to the product as "Polyester." We prefer to rely on our readers to separate the wheat from the chaff. You're always welcome to contact News Editor Pete Bartolik at (800) 343-6474, send a fax to (508) 875-8931 or reach out electronically on Compuserve at 76537,2413

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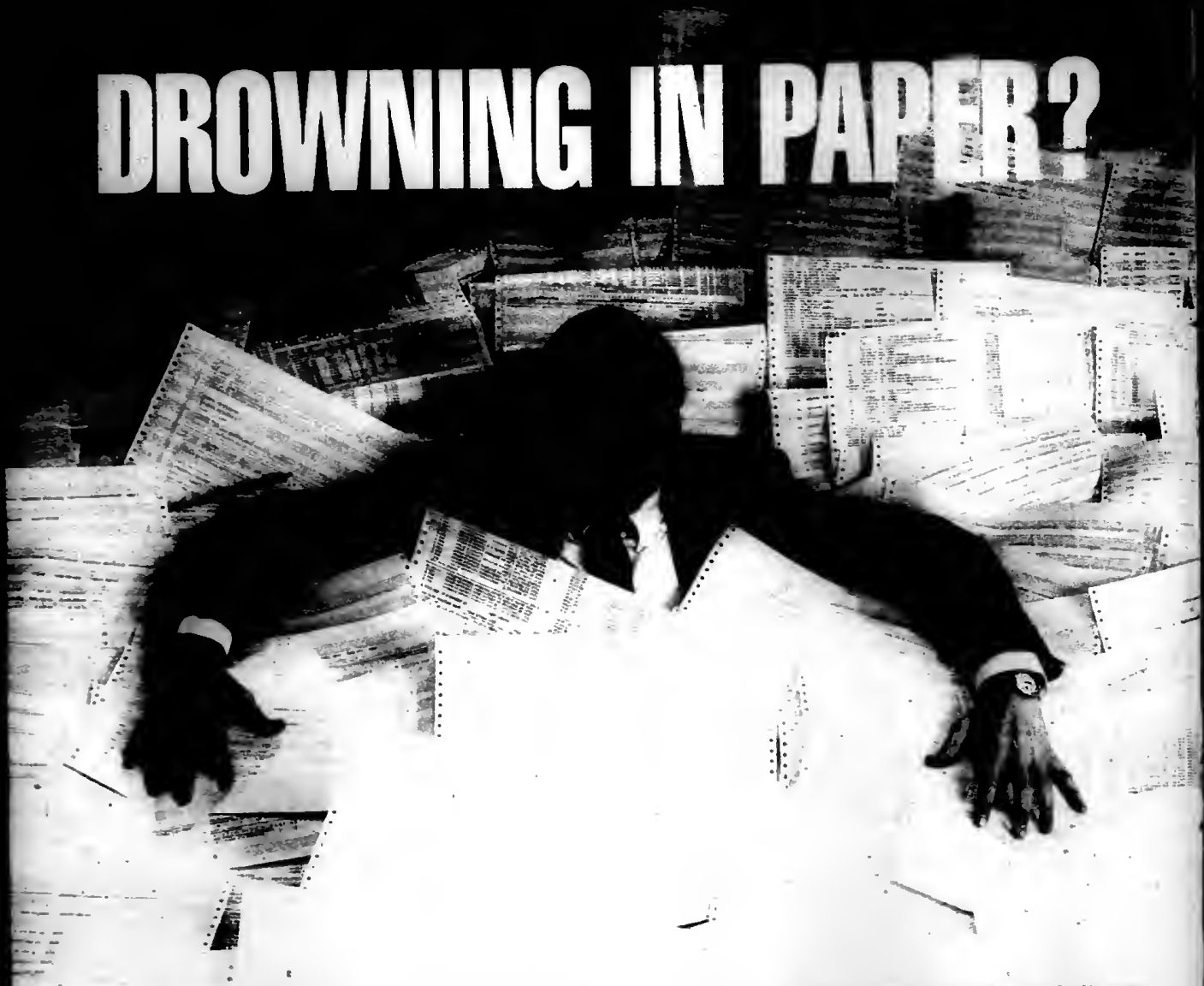

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